Appraising Physical Status: Methods and Norms

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APPRAISING PHYSICAL STATUS: METHODS AND NORMS

by

C. H. McCloy

George D. Stoddard, Ph.D., Editor
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FOREWORD

This volume, as the name implies, is a sequel to *Appraising Physical Status: The Selection of Measurements* which appeared in the Station studies in 1936. Emphasis is placed upon the standards and norms which are presented in detail. An attempt is made also to indicate the practical applications of the material, especially in school situations. It is fair to say that the two volumes, taken together, offer the most complete guide available for a program devoted to the measurement of American boys and girls over wide age ranges.

In addition to the anthropometric materials there are presented brief accounts of related phenomena in sex differences, internal secretions and physiological growth.

George D. Stoddard

Office of the Director
Iowa Child Welfare Research Station
University of Iowa
April 26, 1938

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This monograph represents a compilation of studies which have been carried on by a large number of the staff of the Iowa Child Welfare Research Station. Owing to the interlocking nature of many of these studies, and to the fact that frequently several staff members have co-operated in carrying out a study, it is, in general, impossible to assign credit to any individual for work done. Where this has been possible, acknowledgment is made in the text or in a footnote. Individuals whose studies have contributed to this volume are: Bernice Boynton, June Constantine, Abraham Kantrow, Harriet Kelly, Helen Garside Kelly, Virginia B. Knott, Everett L. Marshall, C. H. McCloy, Howard V. Meredith, Eleanor Metheny, Rosemary Royce, and Arthur J. Wendler. The results have been assembled and the discussion written by C. H. McCloy.

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CHAPTER I

GENERAL CONSIDERATIONS

Adequate appraisals of physical status by means of anthropometric measurements are dependent upon at least three factors:

1. The selection of the best batteries of measurements for the purpose
2. The devising of standards and norms from these measurements
3. The application of these measurements and norms, together with experienced observation and common sense

The selection of measurements has been the subject of very extensive studies in this Station, the results of which have been reported in a previous publication (40). This study will concern itself primarily with the second phase, the problem of standards and norms computed from these selected measurements. The third problem is very difficult to attack effectively through the printed page, for experience in observing the individuals and adjusting to their physical peculiarities is not greatly enhanced by reading. An attempt will be made, however, to contribute as much as possible to this problem.

In this study, an acquaintance with the researches in the study referred to above will be assumed, though the essential conclusions reported there will be recapitulated. The emphasis in this study is upon practical standards. Some basic researches are reported here, however, when the problem of what measurements to use has not already been reported elsewhere in the literature. In some cases, report is given of technique and standards of useful methods developed elsewhere which are of great value and which should be included here to round out the picture.

STATISTICAL TECHNIQUES

The development of standards has, in general, utilized the linear multiple regression equation as the essential tool. The validity of this procedure will depend upon whether or not the assumptions underlying the use of the method are met in the case of these studies. The only important assumptions which must be satisfied are:

1. The accuracy of measurements: This problem is not an easy one in any

institution where measurements from year to year are taken by different measures. Only measurements taken after the author assumed charge of the division of physical growth of this Station have been included, and all measurements have been taken by measurers trained by him. The care with which the measurements have been taken by individual measurers has not been easy to determine. Measurements have been taken on each person by only one measurer. The size of the staff and the school situations have not permittted repeated measurements by different measurers. The reliabilities of the same measurer will vary from measurement to measurement. The objectivities of different measures will vary more. These difficulties are frankly recognized here. If there are relatively large unreliabilities of certain individual measurers, the statistical effect will be primarily that of lowering the intercorrelations and altering somewhat the multiple regressions.

2. Linearity of regression of the zero order correlations: Extensive experiments were carried on with this problem. Numerous scattergrams were made of intercorrelations with various numbers of cases. Within one age group it is believed that the criteria of linearity are met sufficiently well to justify the use of the ordinary linear multiple regression equations in these studies.

The criterion used was the usual one—Blakeman's criterion (7). In this criterion a probable error of the difference between the square of the correlation ratio (η) and the correlation coefficient (r) have been computed. If this difference is not more than 2.5 times the probable error, the regression is considered to be reasonably linear. To simplify the computation, this has been reduced to the equation

$$N\ (\eta^2 - r^2) < 11.37 \qquad (N = \text{number of cases})$$

This criterion offers some difficulties due to differences in numbers of cases. To illustrate, if $\eta = .8650$ and $r = .8211$, the product of $N(\eta^2 - r^2)$ will equal 7.40 for 100 cases, 14.80 for 200 cases, 22.20 for 500 cases, and 74.00 for 1,000 cases. This would probably not be sufficiently linear. For values of $\eta = .8650$ and $r = .8420$, however, the products would be 3.92 for 100 cases, 7.84 for 200 cases, 19.60 for 500 cases, and 39.2 for 1,000 cases. Here it would be, according to this criterion, linear for 100 cases and 200 cases (and up to 290 cases), but curvilinear beyond that. Furthermore, for 10,000 cases, $\eta = .8650$ and $r = .8643$ would be curvilinear, though the most meticulous inspection of a line through the means of the arrays would fail to show where the curvilinearity might be.

Because of this difficulty, we have determined the fact of rectilinearity of regression between such scattergrams as were studied (all for six ages of boys, and for two ages of girls) from the fact that they both satisfied Blakeman's criterion for the numbers used, and, in addition, seemed sufficiently linear to an expert statistician upon inspection of lines drawn through the means of the arrays. While this is a subjective method, and not objectively defensible, it should be noted that this is in addition to satisfying Blakeman's criterion for the numbers employed.

When large numbers were plotted, as in the case of the boy's data from the high school ages, significant departures were noted only at the extremes of the distribution where the numbers were so few as to be negligible. This possible departure in the case of very tall or very short individuals must, however, be kept in mind by measurers, and this phase of the subject will be treated in Chapter XI. It is frequently caused by marked discrepancies between chronological age and anatomical age.

To investigate the problems more carefully, a study of results obtained from the usual linear regression equation as compared with attempts to apply more refined curvilinear techniques was conducted by Miss June Constantine. The subjects consisted of 617 private school boys with an age range of from 15 to 20.5 years, heights of from 61 to 75.5 inches, weights of from 100 to 235.5 pounds, and chest girths of from 29.8 to 44.5 inches. The group was selected so as to embrace only postpubescents, and to insure a range long enough to give curvilinear regressions. The problem was to predict weight from height and chest girth. The intercorrelations, both curvilinear and rectilinear, together with Blakeman's criterion, were as follows:

Measurement	η	r	Blakeman's Criterion
Weight and height	.5422	.5262	10.55
Weight and chest	.8409	.8293	11.97
Chest and height	.3589	.3118	19.50

The η's computed were in each case the larger of the two correlation ratios as shown by the configuration of the line of means of the arrays. Hence it is known that all relationships were, according to the Blakeman criterion, very near or over the border of linearity. The regular rectilinear regression equation was computed, and the $R = .8759$.

Partial correlation scattergrams were then made according to the method proposed by McCloy (36) in which the residuals of height and chest from the means of the arrays were plotted and the partial r and η both computed. The weighted mean standard deviation from each array of height and chest (from the weight regression line) was then computed and used for the standard deviations. Using the partial η values and these standard deviations, a kind of combination multiple regression was computed. The regular linear regression equation was as follows:

$$\text{Predicted Weight} = 2.336\ \text{Height} + 6.828\ \text{Chest Girth} - 256.2$$

The "weighted curvilinear regression equation" was as follows:

$$\text{Predicted Weight} = 3.280\ \text{Height} + 5.3284\ \text{Chest Girth} - 268.5$$

The multiple correlation (computed) was .8436, which was smaller than that found with the regular linear multiple regression equation.

Another attempt was made to predict weight by curvilinear methods. The weight was predicted from the curvilinear regression line of the best fit from both height and chest girth. These weights were then multiplied by constants derived from the proportional weights of height and chest girth in the curvilinear regression equations. (These constants were .381 and .619 respectively.) This gave a correlation of .8564 with actual weight as compared with .8759 for the linear regression equation.

The conclusion was that within limits of not-too-great curvilinearity of regression of zero order correlations, the regular linear multiple regression equation gives results superior to those obtained from such other devices as those tried.

In these studies the curvilinearity did not exceed the limits of Blakeman's criterion in any of the cases tried, nor would this have been the case when the numbers were not greater than 400.[1] It is felt, therefore, that the use of this multiple regression equation is justified throughout this work.

As was stated in the preceding study, the standards given were determined as much from the standpoint of practical use as from that of meticulous scientific accuracy. Where a multiple correlation for predicting normal weight is raised from .921 for four measurements to .943 for seven measurements, it has not been thought that the additional accuracy justified the extra work of computation, for it is probable that the additional work would cause many to feel that the methods were impracticable in the situations usually found in the schools or the physician's office.

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[1] Neither Sheppard's correction nor the correction for η was applied. Were these applied, the probable error of the difference between η and r would be negligible.

CHAPTER II

STANDARDS OF BODY TYPE

Studies conducted in this Station and reported elsewhere (40) have found that for the purpose of classifying body type for anthropometric standards (in contrast to the use of body type for the purpose of predicting susceptibility to specific diseases, as in the work of Draper (19)), two methods seem to give satisfactory results. The better of these—because of the fact that a larger number of measurements of the body contribute to it—is what we have called the Normal Ponderal Index, or 100 times the cube root of the normal body weight in kilograms, divided by the stature in centimeters. The normal weight is computed from measurements of height, chest girth, hip width, and width of knee, with allowances made for differences in relative fatness. (See Chapter IV) This index is based upon the fact that weight is a measure of volume, and to compare it directly to a linear measure such as height, one must first extract the cube root. Evidence of this was presented in the reference cited (42). Where normal weight is to be computed, this is the method of choice.

If normal weight is not to be computed, a shorter but quite satisfactory method is to use the Vital Index (37). This is taken as the normal chest girth (corrected for fat) divided by the height. In both of these indices the corrections for fat insure that the index is a true index of build, not just of relative fatness or thinness. The Vital Index is not as accurate as the Normal Ponderal Index for the reason that anomalies of chest shape and size are not always compensated for by the sizes of hips and knee (representing the long bone sizes). The correspondence is very close, however, in the vast majority of cases, especially in males.

To obtain standards for body type, these indices were computed for ages from two days to twenty years. Both the means for each year and the standard deviations were smoothed, and best fitting lines passed through these smoothed means and standard deviations. The standards for each age are then expressed in terms of standard deviations from the means. To simplify the use of the standards, we have stated them in terms of zones based on "T-score" units

(40) computed from the smoothed means and the standard deviations rather than from the percentiles. This statistical device has come into relatively common use among educators and is widely understood. Briefly, the basis of the T-score is that the mean is given a score of 50, and an additional point is added or subtracted for each one-tenth of a standard deviation above or below the mean. Thus one standard deviation above the mean would have a score of 60, while three standard deviations below the mean would be scored 20. It is felt that this will enable us to express deviations of build in terms that will be comparable from age to age. Standards for the Normal Ponderal Index and the Vital Index will be found in Tables 1 to 4.

A convenient, useful, and readily understood index of build may be obtained from the computed normal weight and the average weight from the standard age-height-weight tables (p. 121). This index is expressed simply as the per cent that the normal weight is of the average for that age, sex, and height. For example, assume a girl, aged 8, height 124 cms. From these and measurements of her chest girth (corrected for fat), hip width (corrected for fat), and knee width, we compute her normal weight and find it to be 24.7 kilograms (nude weight). The age-height-weight table (p. 122) states that the normal weight of an eight-year-old girl of 124 cms. in height is 23.8 kilograms (clothed weight). Subtracting 1 kilogram for clothing (weighed without shoes), this is 22.8 kilograms. The normal weight by our formulae (See Chapter III) of this average weight for age, sex, and height is $100 \text{ x } \frac{24.7}{23.8}$ or 104 per cent. Since the "build" of all children will be computed from their own norms, these per cent figures need no other tables for their interpretation. This was not feasible for the other standards discussed above. This will be called the "Percentage Index of Build."

OTHER TABLES FOR DETERMINING BUILD INDICES

In other publications (41, 42, 47) certain other indices of build have been suggested. Among these are the following:

The Stature Index $100 \text{ x } \frac{\text{Sitting Height}}{\text{Standing Height}}$

The Shoulder Index $100 \text{ x } \frac{\text{Shoulder Width}}{\text{Standing Height}}$

The Hip-Height Index $100 \text{ x } \frac{\text{Hip Width}}{\text{Standing Height}}$

Table 1

T-Scores for Ponderal Index $\frac{\sqrt[3]{\text{Wt. (kg.)}}}{\text{St. Ht. (cms.)}}$: Males

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.0249	.0239	.0232	.0221	.0211	.0206	.0205	.0204	.0199	.0192	.0180	.0174	.0172	.0176	.0179	.0182	.0184	.0185	.0186	.0189	.0191	.0194
5	.0254	.0244	.0237	.0225	.0215	.0210	.0209	.0207	.0203	.0196	.0185	.0180	.0178	.0181	.0183	.0186	.0188	.0189	.0190	.0193	.0195	.0198
10	.0258	.0248	.0241	.0230	.0219	.0214	.0212	.0211	.0206	.0200	.0190	.0185	.0183	.0186	.0188	.0191	.0192	.0193	.0194	.0197	.0198	.0201
15	.0263	.0253	.0246	.0234	.0224	.0218	.0216	.0214	.0210	.0204	.0195	.0191	.0189	.0191	.0193	.0195	.0196	.0197	.0198	.0200	.0202	.0205
20	.0268	.0257	.0250	.0238	.0228	.0222	.0219	.0217	.0213	.0208	.0200	.0196	.0194	.0196	.0197	.0199	.0200	.0201	.0202	.0204	.0206	.0208
25	.0273	.0262	.0255	.0243	.0232	.0226	.0223	.0221	.0217	.0212	.0205	.0202	.0200	.0201	.0202	.0204	.0205	.0205	.0206	.0208	.0210	.0212
30	.0277	.0267	.0259	.0247	.0236	.0230	.0226	.0224	.0220	.0216	.0210	.0207	.0205	.0206	.0207	.0205	.0209	.0209	.0209	.0212	.0213	.0216
35	.0282	.0271	.0264	.0251	.0240	.0234	.0230	.0227	.0224	.0220	.0215	.0213	.0211	.0211	.0211	.0212	.0213	.0213	.0213	.0216	.0217	.0219
40	.0287	.0276	.0268	.0255	.0245	.0238	.0233	.0230	.0227	.0224	.0220	.0218	.0216	.0216	.0216	.0216	.0217	.0217	.0217	.0219	.0221	.0223
45	.0291	.0280	.0273	.0260	.0249	.0242	.0237	.0234	.0231	.0228	.0225	.0224	.0222	.0221	.0220	.0221	.0221	.0221	.0221	.0223	.0224	.0226
50	.0296	.0285	.0277	.0264	.0253	.0246	.0240	.0237	.0234	.0232	.0230	.0229	.0227	.0226	.0225	.0225	.0225	.0225	.0225	.0227	.0228	.0230
55	.0301	.0290	.0282	.0268	.0257	.0250	.0244	.0240	.0238	.0236	.0235	.0235	.0233	.0231	.0230	.0229	.0229	.0229	.0229	.0231	.0232	.0234
60	.0305	.0294	.0286	.0273	.0261	.0254	.0247	.0244	.0241	.0240	.0240	.0240	.0238	.0236	.0234	.0234	.0233	.0233	.0233	.0235	.0235	.0237
65	.0310	.0299	.0291	.0277	.0266	.0258	.0251	.0247	.0245	.0244	.0245	.0246	.0244	.0241	.0239	.0238	.0237	.0237	.0237	.0238	.0239	.0241
70	.0315	.0303	.0295	.0281	.0270	.0262	.0254	.0250	.0248	.0248	.0250	.0251	.0249	.0246	.0243	.0242	.0241	.0241	.0241	.0242	.0243	.0244
75	.0320	.0308	.0300	.0286	.0274	.0266	.0258	.0254	.0252	.0252	.0255	.0257	.0255	.0251	.0248	.0247	.0246	.0245	.0245	.0246	.0247	.0248
80	.0324	.0313	.0304	.0290	.0278	.0270	.0261	.0257	.0255	.0256	.0260	.0262	.0260	.0256	.0253	.0251	.0250	.0249	.0248	.0250	.0250	.0252
85	.0329	.0317	.0309	.0294	.0282	.0274	.0265	.0260	.0259	.0260	.0265	.0268	.0266	.0261	.0257	.0255	.0254	.0253	.0252	.0254	.0254	.0255
90	.0334	.0322	.0313	.0298	.0287	.0278	.0268	.0263	.0262	.0264	.0270	.0273	.0271	.0266	.0262	.0259	.0258	.0257	.0256	.0257	.0258	.0259
95	.0338	.0326	.0318	.0303	.0291	.0282	.0272	.0267	.0266	.0268	.0275	.0279	.0277	.0271	.0266	.0264	.0262	.0261	.0260	.0261	.0261	.0262
100	.0343	.0331	.0322	.0307	.0295	.0286	.0275	.0270	.0269	.0272	.0280	.0284	.0282	.0276	.0271	.0268	.0266	.0265	.0264	.0265	.0265	.0266

Table 2

T-Scores for Ponderal Index $\frac{\sqrt[3]{\text{Wt (kg.)}}}{\text{St. Ht. (cms.)}}$: Females

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.0251	.0251	.0233	.0222	.0213	.0206	.0205	.0207	.0205	.0196	.0192	.0190	.0189	.0188	.0186	.0182	.0181	.0181	.0185	.0189	.0188	.0188
5	.0256	.0256	.0237	.0226	.0217	.0210	.0209	.0210	.0208	.0200	.0195	.0194	.0193	.0192	.0190	.0187	.0186	.0185	.0190	.0193	.0192	.0192
10	.0260	.0260	.0241	.0231	.0221	.0214	.0212	.0213	.0211	.0203	.0199	.0198	.0197	.0197	.0195	.0192	.0191	.0190	.0194	.0197	.0196	.0196
15	.0265	.0265	.0246	.0235	.0225	.0218	.0216	.0216	.0214	.0207	.0203	.0202	.0201	.0201	.0199	.0197	.0196	.0195	.0199	.0201	.0200	.0200
20	.0269	.0269	.0250	.0239	.0229	.0222	.0219	.0219	.0217	.0210	.0207	.0206	.0205	.0205	.0204	.0202	.0201	.0200	.0203	.0205	.0204	.0204
25	.0274	.0274	.0255	.0244	.0234	.0226	.0223	.0222	.0220	.0214	.0211	.0210	.0209	.0210	.0208	.0207	.0206	.0205	.0208	.0209	.0208	.0208
30	.0278	.0278	.0259	.0248	.0238	.0229	.0226	.0225	.0223	.0217	.0215	.0214	.0213	.0214	.0213	.0211	.0211	.0210	.0212	.0213	.0212	.0212
35	.0283	.0283	.0264	.0251	.0242	.0233	.0230	.0228	.0226	.0221	.0218	.0218	.0218	.0218	.0217	.0216	.0216	.0215	.0217	.0217	.0216	.0216
40	.0287	.0287	.0268	.0256	.0246	.0237	.0233	.0231	.0229	.0224	.0222	.0222	.0222	.0222	.0222	.0221	.0221	.0220	.0221	.0221	.0220	.0220
45	.0292	.0292	.0273	.0261	.0250	.0241	.0237	.0234	.0232	.0228	.0226	.0226	.0226	.0227	.0226	.0226	.0226	.0225	.0226	.0225	.0224	.0224
50	.0296	.0296	.0277	.0265	.0254	.0245	.0240	.0237	.0235	.0231	.0230	.0230	.0230	.0231	.0231	.0231	.0231	.0230	.0230	.0229	.0228	.0228
55	.0301	.0301	.0281	.0269	.0258	.0249	.0244	.0240	.0238	.0235	.0234	.0234	.0234	.0235	.0236	.0236	.0236	.0235	.0235	.0233	.0232	.0232
60	.0305	.0305	.0286	.0274	.0262	.0253	.0247	.0243	.0241	.0238	.0238	.0238	.0238	.0240	.0240	.0241	.0241	.0240	.0239	.0237	.0236	.0236
65	.0310	.0310	.0290	.0278	.0266	.0257	.0251	.0246	.0244	.0242	.0242	.0242	.0242	.0244	.0245	.0246	.0246	.0245	.0244	.0241	.0240	.0240
70	.0314	.0314	.0295	.0282	.0270	.0261	.0254	.0249	.0247	.0245	.0245	.0246	.0247	.0248	.0249	.0251	.0251	.0250	.0248	.0245	.0244	.0244
75	.0319	.0319	.0299	.0287	.0275	.0265	.0258	.0252	.0250	.0249	.0249	.0250	.0251	.0253	.0254	.0256	.0256	.0255	.0253	.0249	.0248	.0248
80	.0323	.0323	.0304	.0291	.0279	.0268	.0261	.0255	.0253	.0252	.0253	.0254	.0255	.0257	.0258	.0260	.0261	.0260	.0257	.0253	.0252	.0252
85	.0328	.0328	.0308	.0295	.0283	.0272	.0265	.0258	.0256	.0256	.0257	.0258	.0259	.0261	.0263	.0265	.0266	.0265	.0262	.0257	.0256	.0256
90	.0332	.0332	.0313	.0299	.0287	.0276	.0268	.0261	.0259	.0259	.0261	.0262	.0263	.0265	.0267	.0270	.0271	.0270	.0266	.0261	.0260	.0260
95	.0337	.0337	.0317	.0304	.0291	.0280	.0272	.0264	.0262	.0263	.0265	.0266	.0267	.0270	.0272	.0275	.0276	.0275	.0271	.0265	.0264	.0264
100	.0341	.0341	.0322	.0308	.0295	.0284	.0275	.0268	.0265	.0266	.0269	.0271	.0272	.0274	.0277	.0280	.0281	.0280	.0275	.0270	.0268	.0268

Table 3

T-Scores for Vital Index $\frac{\text{Chest Girth}}{\text{St. Height}}$: Males

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.5365	.4820	.4495	.4205	.4095	.4010	.3900	.3775	.3635	.3535	.3480	.3440	.3405	.3370	.3315	.3345	.3375	.3365	.3366	.3330	.3305	.3310
5	.5479	.4970	.4633	.4323	.4199	.4106	.3995	.3873	.3740	.3644	.3591	.3551	.3517	.3483	.3437	.3472	.3506	.3499	.3502	.3470	.3448	.3453
10	.5602	.5120	.4770	.4440	.4302	.4202	.4090	.3970	.3844	.3752	.3702	.3662	.3628	.3596	.3558	.3598	.3636	.3632	.3638	.3610	.3590	.3596
15	.5726	.5270	.4908	.4558	.4406	.4298	.4185	.4068	.3949	.3861	.3813	.3773	.3740	.3709	.3680	.3725	.3767	.3766	.3775	.3750	.3733	.3739
20	.5849	.5420	.5045	.4675	.4509	.4394	.4280	.4165	.4053	.3969	.3924	.3884	.3851	.3822	.3801	.3851	.3897	.3899	.3911	.3890	.3875	.3882
25	.5973	.5570	.5183	.4793	.4613	.4490	.4375	.4263	.4158	.4078	.4035	.3995	.3963	.3935	.3923	.3978	.4028	.4033	.4048	.4030	.4018	.4025
30	.6096	.5720	.5320	.4910	.4716	.4586	.4470	.4360	.4262	.4186	.4146	.4106	.4074	.4048	.4044	.4104	.4158	.4166	.4184	.4170	.4160	.4168
35	.6220	.5870	.5458	.5028	.4820	.4682	.4565	.4458	.4367	.4295	.4257	.4217	.4186	.4161	.4166	.4231	.4289	.4300	.4321	.4310	.4303	.4311
40	.6343	.6020	.5595	.5145	.4923	.4778	.4660	.4555	.4471	.4403	.4368	.4328	.4297	.4274	.4287	.4357	.4419	.4433	.4457	.4450	.4445	.4454
45	.6467	.6170	.5733	.5263	.5027	.4874	.4755	.4653	.4576	.4512	.4479	.4439	.4409	.4387	.4409	.4484	.4550	.4567	.4594	.4590	.4588	.4597
50	.6590	.6320	.5870	.5380	.5130	.4970	.4850	.4750	.4680	.4620	.4590	.4550	.4520	.4500	.4530	.4610	.4680	.4700	.4730	.4730	.4730	.4740
55	.6714	.6470	.6008	.5498	.5234	.5066	.4945	.4848	.4785	.4729	.4701	.4661	.4632	.4613	.4652	.4737	.4811	.4834	.4867	.4870	.4873	.4883
60	.6837	.6620	.6145	.5615	.5337	.5162	.5040	.4945	.4889	.4837	.4812	.4772	.4743	.4726	.4773	.4863	.4941	.4967	.5003	.5010	.5015	.5026
65	.6961	.6770	.6283	.5733	.5441	.5258	.5135	.5043	.4994	.4946	.4923	.4883	.4855	.4839	.4895	.4990	.5072	.5101	.5140	.5150	.5158	.5169
70	.7084	.6920	.6420	.5850	.5544	.5354	.5230	.5140	.5098	.5054	.5034	.4994	.4966	.4952	.5016	.5116	.5202	.5234	.5276	.5290	.5300	.5312
75	.7208	.7070	.6558	.5968	.5648	.5450	.5325	.5238	.5203	.5163	.5145	.5105	.5078	.5065	.5138	.5243	.5333	.5368	.5413	.5430	.5443	.5455
80	.7331	.7220	.6695	.6085	.5751	.5546	.5420	.5335	.5307	.5271	.5256	.5216	.5189	.5178	.5259	.5369	.5463	.5501	.5549	.5570	.5585	.5598
85	.7455	.7370	.6833	.6203	.5855	.5642	.5515	.5433	.5412	.5380	.5367	.5327	.5301	.5291	.5381	.5496	.5594	.5635	.5686	.5710	.5728	.5741
90	.7578	.7520	.6970	.6320	.5958	.5738	.5610	.5530	.5516	.5488	.5478	.5438	.5412	.5404	.5502	.5622	.5724	.5768	.5822	.5850	.5870	.5884
95	.7702	.7670	.7108	.6438	.6062	.5834	.5705	.5628	.5621	.5597	.5589	.5549	.5524	.5517	.5624	.5749	.5855	.5902	.5959	.5990	.6013	.6027
100	.7825	.7820	.7245	.6555	.6165	.5930	.5800	.5725	.5725	.5705	.5700	.5660	.5635	.5630	.5745	.5875	.5985	.6035	.6095	.6130	.6155	.6170

Table 4

T-Scores for Vital Index $\frac{\text{Chest Girth}}{\text{St. Height}}$: Females

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.5270	.4950	.4585	.4270	.4010	.3855	.3760	.3690	.3645	.3510	.3390	.3340	.3280	.3120	.2800	.2560	.2550	.2720	.3020	.3170	.3210	.3190
5	.5407	.5085	.4718	.4395	.4129	.3968	.3865	.3791	.3743	.3614	.3502	.3454	.3398	.3255	.2968	.2750	.2739	.2890	.3159	.3295	.3331	.3314
10	.5544	.5220	.4850	.4520	.4248	.4080	.3970	.3892	.3840	.3718	.3614	.3568	.3516	.3390	.3136	.2940	.2928	.3060	.3298	.3420	.3452	.3438
15	.5681	.5355	.4983	.4645	.4367	.4193	.4075	.3993	.3938	.3822	.3726	.3682	.3634	.3525	.3304	.3130	.3117	.3230	.3437	.3545	.3573	.3562
20	.5818	.5490	.5115	.4770	.4486	.4305	.4180	.4094	.4035	.3926	.3838	.3796	.3752	.3660	.3472	.3320	.3306	.3400	.3576	.3670	.3694	.3686
25	.5955	.5625	.5248	.4895	.4605	.4418	.4285	.4195	.4133	.4030	.3950	.3910	.3870	.3795	.3640	.3510	.3495	.3570	.3715	.3795	.3815	.3810
30	.6092	.5760	.5380	.5020	.4724	.4530	.4390	.4296	.4230	.4134	.4062	.4024	.3988	.3930	.4808	.3700	.3684	.3740	.3854	.3920	.3936	.3934
35	.6229	.5895	.5513	.5145	.4843	.4643	.4495	.4397	.4328	.4238	.4174	.4138	.4106	.4065	.3976	.3890	.3873	.3910	.3993	.4045	.4057	.4058
40	.6366	.6030	.5645	.5270	.4962	.4755	.4600	.4498	.4425	.4342	.4286	.4252	.4224	.4200	.4144	.4080	.4062	.4080	.4132	.4170	.4178	.4182
45	.6503	.6165	.5778	.5395	.5081	.4868	.4705	.4599	.4523	.4446	.4398	.4366	.4342	.4335	.4312	.4270	.4251	.4260	.4271	.4295	.4299	.4306
50	.6640	.6300	.5910	.5520	.5200	.4980	.4810	.4700	.4620	.4550	.4510	.4480	.4460	.4470	.4480	.4460	.4440	.4420	.4410	.4420	.4420	.4430
55	.6777	.6435	.6043	.5645	.5319	.5093	.4915	.4801	.4718	.4654	.4622	.4594	.4578	.4605	.4648	.4650	.4629	.4590	.4549	.4545	.4541	.4554
60	.6914	.6570	.6175	.5770	.5438	.5205	.5020	.4902	.4815	.4758	.4734	.4708	.4696	.4740	.4816	.4840	.4818	.4760	.4688	.4670	.4662	.4678
65	.7051	.6705	.6308	.5895	.5557	.5318	.5125	.5003	.4913	.4862	.4846	.4822	.4814	.4875	.4984	.5030	.5007	.4930	.4827	.4795	.4783	.4802
70	.7188	.6840	.6440	.6020	.5676	.5430	.5230	.5104	.5010	.4966	.4958	.4936	.4932	.5010	.5152	.5220	.5196	.5100	.4966	.4920	.4904	.4926
75	.7325	.6975	.6573	.6145	.5795	.5543	.5335	.5205	.5108	.5070	.5070	.5050	.5050	.5145	.5320	.5410	.5385	.5270	.5105	.5045	.5025	.5050
80	.7462	.7110	.6705	.6270	.5914	.5655	.5440	.5306	.5205	.5174	.5182	.5164	.5168	.5280	.5488	.5600	.5574	.5440	.5244	.5170	.5146	.5174
85	.7599	.7245	.6838	.6395	.6033	.5768	.5545	.5407	.5303	.5278	.5294	.5278	.5286	.5415	.5656	.5790	.5763	.5610	.5383	.5295	.5267	.5298
90	.7736	.7380	.6970	.6520	.6152	.5880	.5650	.5508	.5400	.5382	.5406	.5392	.5404	.5550	.5824	.5980	.5952	.5780	.5522	.5420	.5388	.5422
95	.7873	.7515	.7103	.6645	.6271	.5993	.5755	.5609	.5498	.5486	.5518	.5506	.5522	.5685	.5992	.6170	.6141	.5950	.5661	.5545	.5509	.5546
100	.8010	.7650	.7235	.6770	.6390	.6105	.5860	.5710	.5595	.5590	.5630	.5620	.5640	.5820	.6160	.6360	.6330	.6120	.5800	.5670	.5630	.5670

Table 5

T-Scores for Stature Index $\frac{\text{Sitting Height}}{\text{Standing Height}}$: Males

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.5590	.5580	.5310	.5170	.5030	.4925	.4855	.4800	.4765	.4760	.4725	.4705	.4665	.4600	.4530	.4450	.4400	.4335	.4270	.4190	.4100	.3995
5	.5690	.5676	.5401	.5254	.5109	.5002	.4930	.4871	.4832	.4822	.4783	.4760	.4718	.4654	.4590	.4518	.4476	.4420	.4364	.4294	.4215	.4122
10	.5790	.5772	.5492	.5338	.5188	.5078	.5004	.4942	.4898	.4884	.4840	.4814	.4770	.4708	.4650	.4586	.4552	.4504	.4458	.4398	.4330	.4248
15	.5890	.5868	.5583	.5422	.5267	.5155	.5079	.5013	.4965	.4946	.4898	.4869	.4823	.4762	.4710	.4654	.4628	.4589	.4552	.4502	.4445	.4375
20	.5990	.5964	.5674	.5506	.5346	.5231	.5153	.5084	.5031	.5008	.4955	.4923	.4875	.4816	.4770	.4722	.4704	.4673	.4646	.4606	.4560	.4501
25	.6090	.6060	.5765	.5590	.5425	.5308	.5228	.5155	.5098	.5070	.5013	.4978	.4928	.4870	.4830	.4790	.4780	.4758	.4740	.4710	.4675	.4628
30	.6190	.6156	.5856	.5674	.5504	.5384	.5302	.5226	.5164	.5132	.5070	.5032	.4980	.4924	.4890	.4858	.4856	.4842	.4834	.4814	.4790	.4754
35	.6290	.6252	.5947	.5758	.5583	.5461	.5377	.5297	.5231	.5194	.5128	.5087	.5033	.4978	.4950	.4926	.4932	.4927	.4928	.4918	.4905	.4881
40	.6390	.6348	.6038	.5842	.5662	.5537	.5451	.5368	.5297	.5256	.5185	.5141	.5085	.5032	.5010	.4994	.5008	.5011	.5022	.5022	.5020	.5007
45	.6490	.6444	.6129	.5926	.5741	.5614	.5526	.5439	.5364	.5318	.5243	.5196	.5138	.5086	.5070	.5062	.5084	.5096	.5116	.5126	.5135	.5134
50	.6590	.6540	.6220	.6010	.5820	.5690	.5600	.5510	.5430	.5380	.5300	.5250	.5190	.5140	.5130	.5130	.5160	.5180	.5210	.5230	.5250	.5260
55	.6690	.6636	.6311	.6094	.5899	.5767	.5675	.5581	.5497	.5442	.5358	.5305	.5243	.5194	.5190	.5198	.5236	.5265	.5304	.5334	.5365	.5387
60	.6790	.6732	.6402	.6178	.5978	.5843	.5749	.5652	.5563	.5504	.5415	.5359	.5295	.5248	.5250	.5266	.5312	.5349	.5398	.5438	.5480	.5513
65	.6890	.6828	.6493	.6262	.6057	.5920	.5824	.5723	.5630	.5566	.5473	.5414	.5348	.5302	.5310	.5334	.5388	.5434	.5492	.5542	.5595	.5640
70	.6990	.6924	.6584	.6346	.6136	.5996	.5898	.5794	.5696	.5628	.5530	.5468	.5400	.5356	.5370	.5402	.5464	.5518	.5586	.5646	.5710	.5766
75	.7090	.7020	.6675	.6430	.6215	.6073	.5973	.5865	.5763	.5690	.5588	.5523	.5453	.5410	.5430	.5470	.5540	.5603	.5680	.5750	.5825	.5893
80	.7190	.7116	.6766	.6514	.6294	.6149	.6047	.5936	.5829	.5752	.5645	.5577	.5505	.5464	.5490	.5538	.5616	.5687	.5774	.5854	.5940	.6019
85	.7290	.7212	.6857	.6598	.6373	.6226	.6122	.6007	.5896	.5814	.5703	.5632	.5558	.5518	.5550	.5606	.5692	.5772	.5868	.5958	.6055	.6146
90	.7390	.7308	.6948	.6682	.6452	.6302	.6196	.5078	.5962	.5876	.5760	.5686	.5610	.5572	.5610	.5674	.5768	.5856	.5962	.6062	.6170	.6272
95	.7490	.7404	.7039	.6766	.6531	.6379	.6271	.6149	.6029	.5938	.5818	.5741	.5663	.5626	.5670	.5742	.5844	.5941	.6056	.6166	.6285	.6399
100	.7590	.7500	.5130	.6850	.6610	.6455	.6345	.6220	.6095	.6000	.5875	.5795	.5715	.5680	.5730	.5810	.5920	.6025	.6150	.6270	.6400	.6525

Table 6

T-Scores for Stature Index $\frac{\text{Sitting Height}}{\text{Standing Height}}$: Females

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.5920	.5840	.5675	.5340	.5150	.4990	.4900	.4825	.4805	.4740	.4700	.4650	.4610	.4580	.4570	.4590	.4605	.4615	.4640	.4650	.4675	.4655
5	.5992	.5911	.5646	.5409	.5217	.5056	.4966	.4890	.4867	.4800	.4759	.4709	.4671	.4645	.4636	.4656	.4673	.4683	.4707	.4716	.4740	.4720
10	.6064	.5982	.5716	.5478	.5284	.5122	.5032	.4954	.4928	.4860	.4818	.4768	.4732	.4710	.4702	.4722	.4740	.4750	.4774	.4782	.4804	.4784
15	.6136	.6053	.5787	.5547	.5351	.5188	.5098	.5019	.4990	.4920	.4877	.4827	.4793	.4775	.4768	.4788	.4808	.4818	.4841	.4848	.4869	.4849
20	.6208	.6124	.5857	.5616	.5418	.5254	.5164	.5083	.5051	.4980	.4936	.4886	.4854	.4840	.4834	.4854	.4875	.4885	.4908	.4914	.4933	.4913
25	.6280	.6195	.5928	.5685	.5485	.5320	.5230	.5148	.5113	.5040	.4995	.4945	.4915	.4905	.4900	.4920	.4943	.4953	.4975	.4980	.4998	.4978
30	.6352	.6266	.5998	.5754	.5552	.5386	.5296	.5212	.5174	.5100	.5054	.5004	.4976	.4970	.4966	.4986	.5010	.5020	.5042	.5046	.5062	.5042
35	.6424	.6337	.6069	.5823	.5619	.5452	.5362	.5277	.5236	.5160	.5113	.5063	.5037	.5035	.5032	.5052	.5078	.5088	.5109	.5112	.5127	.5107
40	.6496	.6408	.6139	.5892	.5686	.5518	.5428	.5341	.5297	.5220	.5172	.5122	.5098	.5100	.5098	.5118	.5145	.5155	.5176	.5178	.5191	.5171
45	.6568	.6479	.6210	.5961	.5753	.5584	.5494	.5406	.5359	.5280	.5231	.5181	.5159	.5165	.5164	.5184	.5213	.5223	.5243	.5244	.5256	.5236
50	.6640	.6550	.6280	.6030	.5820	.5650	.5560	.5470	.5420	.5340	.5290	.5240	.5220	.5230	.5230	.5250	.5280	.5290	.5310	.5310	.5320	.5300
55	.6712	.6621	.6351	.6099	.5887	.5716	.5626	.5535	.5482	.5400	.5349	.5299	.5281	.5295	.5296	.5316	.5348	.5358	.5377	.5376	.5385	.5365
60	.6784	.6692	.6421	.6168	.5954	.5782	.5692	.5599	.5543	.5460	.5408	.5358	.5342	.5360	.5362	.5382	.5415	.5425	.5444	.5442	.5449	.5429
65	.6856	.6763	.6492	.6237	.6021	.5848	.5758	.5664	.5605	.5520	.5467	.5417	.5403	.5425	.5428	.5448	.5483	.5493	.5511	.5508	.5514	.5494
70	.6928	.6834	.6562	.6306	.6088	.5914	.5824	.5728	.5666	.5580	.5526	.5476	.5464	.5490	.5494	.5514	.5550	.5560	.5578	.5574	.5578	.5558
75	.7000	.6905	.6633	.6375	.6155	.5980	.5890	.5793	.5728	.5640	.5585	.5535	.5525	.5555	.5560	.5580	.5618	.5628	.5645	.5640	.5643	.5623
80	.7072	.6976	.6703	.6444	.6222	.6046	.5956	.5857	.5789	.5700	.5644	.5594	.5586	.5620	.5626	.5646	.5685	.5695	.5712	.5706	.5707	.5687
85	.7144	.7047	.6774	.6513	.6289	.6112	.6022	.5922	.5851	.5760	.5703	.5653	.5647	.5685	.5692	.5712	.5753	.5763	.5779	.5772	.5772	.5752
90	.7216	.7118	.6844	.6582	.6356	.6178	.6088	.5986	.5912	.5820	.5762	.5712	.5708	.5750	.5758	.5778	.5820	.5830	.5846	.5838	.5836	.5816
95	.7288	.7189	.6915	.6651	.6423	.6244	.6154	.6051	.5974	.5880	.5821	.5771	.5769	.5815	.5824	.5844	.5888	.5898	.5913	.5904	.5901	.5881
100	.7360	.7260	.6985	.6720	.6490	.6310	.6220	.6115	.6035	.5940	.5880	.5830	.5830	.5880	.5890	.5910	.5955	.5965	.5980	.5970	.5965	.5945

Table 7

T-Scores for Shoulder Index $\frac{\text{Shoulders (Acromial)}}{\text{Standing Height}}$: Males

T-Score	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.1590	.1550	.1512	.1451	.1420	.1424	.1471	.1545	.1608	.1649	.1673	.1681
5	.1641	.1603	.1567	.1511	.1482	.1486	.1531	.1601	.1662	.1702	.1726	.1734
10	.1692	.1656	.1622	.1570	.1544	.1548	.1590	.1656	.1716	.1754	.1778	.1786
15	.1743	.1709	.1677	.1630	.1606	.1610	.1650	.1712	.1770	.1807	.1831	.1839
20	.1794	.1762	.1732	.1689	.1668	.1672	.1709	.1767	.1824	.1859	.1883	.1891
25	.1845	.1815	.1787	.1749	.1730	.1734	.1769	.1823	.1878	.1912	.1936	.1944
30	.1896	.1868	.1842	.1808	.1792	.1796	.1828	.1878	.1932	.1964	.1988	.1996
35	.1947	.1921	.1897	.1868	.1854	.1858	.1888	.1934	.1986	.2017	.2041	.2049
40	.1998	.1974	.1952	.1927	.1916	.1920	.1947	.1989	.2040	.2069	.2093	.2101
45	.2049	.2027	.2007	.1987	.1978	.1982	.2007	.2045	.2094	.2122	.2146	.2154
50	.2100	.2080	.2062	.2046	.2040	.2044	.2066	.2100	.2148	.2174	.2198	.2206
55	.2151	.2133	.2117	.2106	.2102	.2106	.2126	.2156	.2202	.2227	.2251	.2259
60	.2202	.2186	.2172	.2165	.2164	.2168	.2185	.2211	.2256	.2279	.2303	.2311
65	.2253	.2239	.2227	.2225	.2226	.2230	.2245	.2267	.2310	.2332	.2356	.2364
70	.2304	.2292	.2282	.2284	.2288	.2292	.2304	.2322	.2364	.2384	.2408	.2416
75	.2355	.2345	.2337	.2344	.2350	.2354	.2364	.2378	.2418	.2437	.2461	.2469
80	.2406	.2398	.2392	.2403	.2412	.2416	.2423	.2433	.2472	.2489	.2513	.2521
85	.2457	.2451	.2447	.2463	.2474	.2478	.2483	.2489	.2526	.2542	.2566	.2574
90	.2508	.2504	.2502	.2522	.2536	.2540	.2542	.2544	.2580	.2594	.2618	.2626
95	.2559	.2557	.2557	.2582	.2598	.2602	.2602	.2600	.2634	.2647	.2671	.2679
100	.2610	.2610	.2612	.2641	.2660	.2664	.2661	.2655	.2688	.2699	.2723	.2731

Table 8

T-Scores for Shoulder Index $\frac{\text{Shoulders (acromial)}}{\text{Standing Height}}$: Females

T-Score	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.1757	.1718	.1680	.1637	.1608	.1574	.1554	.1539	.1525	.1474	.1461	.1488	.1547	.1577	.1585	.1591
5	.1797	.1760	.1724	.1683	.1656	.1624	.1606	.1593	.1580	.1734	.1523	.1549	.1604	.1633	.1641	.1647
10	.1837	.1802	.1768	.1729	.1703	.1674	.1658	.1646	.1635	.1594	.1585	.1609	.1661	.1688	.1697	.1703
15	.1877	.1844	.1812	.1775	.1751	.1724	.1710	.1700	.1690	.1654	.1647	.1670	.1718	.1744	.1753	.1759
20	.1917	.1886	.1856	.1821	.1798	.1774	.1762	.1753	.1745	.1714	.1709	.1730	.1775	.1799	.1809	.1815
25	.1957	.1928	.1900	.1867	.1846	.1824	.1814	.1807	.1800	.1774	.1771	.1791	.1832	.1855	.1865	.1871
30	.1997	.1970	.1944	.1913	.1893	.1874	.1866	.1860	.1855	.1834	.1833	.1851	.1889	.1910	.1921	.1927
35	.2037	.2012	.1988	.1959	.1941	.1924	.1918	.1914	.1910	.1894	.1895	.1912	.1946	.1966	.1977	.1983
40	.2077	.2054	.2032	.2005	.1988	.1974	.1970	.1967	.1965	.1954	.1957	.1972	.2003	.2021	.2033	.2039
45	.2117	.2096	.2076	.2051	.2036	.2024	.2022	.2021	.2020	.2014	.2019	.2033	.2060	.2077	.2089	.2095
50	.2157	.2138	.2120	.2097	.2083	.2074	.2074	.2074	.2075	.2074	.2081	.2093	.2117	.2132	.2145	.2151
55	.2197	.2180	.2164	.2143	.2131	.2124	.2126	.2128	.2130	.2134	.2143	.2154	.2174	.2188	.2201	.2207
60	.2237	.2222	.2208	.2189	.2178	.2174	.2178	.2181	.2185	.2194	.2205	.2214	.2231	.2243	.2257	.2263
65	.2277	.2264	.2252	.2235	.2226	.2224	.2230	.2235	.2240	.2254	.2267	.2275	.2288	.2299	.2313	.2319
70	.2317	.2306	.2296	.2281	.2273	.2274	.2282	.2288	.2295	.2314	.2329	.2335	.2345	.2354	.2369	.2375
75	.2357	.2348	.2340	.2327	.2321	.2324	.2334	.2342	.2350	.2374	.2391	.2396	.2402	.2410	.2425	.2431
80	.2397	.2390	.2384	.2373	.2368	.2374	.2386	.2395	.2405	.2434	.2453	.2456	.2459	.2465	.2481	.2487
85	.2437	.2432	.2428	.2419	.2415	.2424	.2438	.2449	.2460	.2494	.2515	.2517	.2516	.2521	.2537	.2543
90	.2477	.2474	.2472	.2465	.2463	.2474	.2490	.2502	.2515	.2554	.2577	.2577	.2573	.2576	.2593	.2599
95	.2517	.2516	.2516	.2511	.2511	.2524	.2542	.2556	.2570	.2614	.2639	.2638	.2630	.2632	.2649	.2655
100	.2557	.2558	.2560	.2557	.2558	.2574	.2594	.2609	.2625	.2674	.2701	.2698	.2687	.2687	.2705	.2711

Table 9

T-Scores for Hip-Height $\frac{\text{Hip Width (Bi-iliac)}}{\text{Standing Height}}$: Males

T-Score	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.1245	.1235	.1228	.1224	.1234	.1241	.1248	.1239	.1243	.1245	.1240	.1230
5	.1280	.1270	.1263	.1259	.1269	.1276	.1283	.1276	.1281	.1284	.1280	.1272
10	.1315	.1305	.1298	.1294	.1303	.1310	.1318	.1313	.1318	.1322	.1320	.1314
15	.1350	.1340	.1333	.1329	.1338	.1345	.1353	.1350	.1356	.1361	.1360	.1356
20	.1385	.1375	.1368	.1364	.1372	.1379	.1388	.1387	.1393	.1399	.1400	.1398
25	.1420	.1410	.1403	.1399	.1407	.1414	.1423	.1424	.1431	.1438	.1440	.1440
30	.1455	.1445	.1438	.1434	.1441	.1448	.1458	.1461	.1468	.1476	.1480	.1482
35	.1490	.1480	.1473	.1469	.1476	.1483	.1493	.1498	.1506	.1515	.1520	.1524
40	.1525	.1515	.1508	.1504	.1510	.1517	.1528	.1535	.1543	.1553	.1560	.1566
45	.1560	.1550	.1543	.1529	.1545	.1552	.1563	.1572	.1581	.1592	.1600	.1608
50	.1595	.1585	.1578	.1574	.1579	.1586	.1598	.1609	.1618	.1630	.1640	.1650
55	.1630	.1620	.1613	.1609	.1614	.1621	.1633	.1646	.1656	.1669	.1680	.1692
60	.1665	.1655	.1648	.1644	.1648	.1655	.1668	.1683	.1693	.1707	.1720	.1734
65	.1700	.1690	.1683	.1679	.1683	.1690	.1703	.1720	.1731	.1746	.1760	.1776
70	.1735	.1725	.1718	.1714	.1717	.1724	.1738	.1757	.1768	.1784	.1800	.1818
75	.1770	.1760	.1753	.1749	.1752	.1759	.1773	.1794	.1806	.1823	.1840	.1860
80	.1805	.1795	.1788	.1784	.1786	.1793	.1808	.1831	.1843	.1861	.1880	.1902
85	.1840	.1830	.1823	.1819	.1821	.1828	.1843	.1868	.1881	.1900	.1920	.1944
90	.1875	.1865	.1858	.1854	.1855	.1862	.1878	.1905	.1918	.1938	.1960	.1986
95	.1910	.1900	.1893	.1889	.1890	.1897	.1913	.1942	.1956	.1977	.2000	.2028
100	.1945	.1935	.1928	.1924	.1924	.1931	.1948	.1979	.1993	.2015	.2040	.2070

Table 10

T-Scores for Hip Height Index $\frac{\text{Hip Width (Bi-iliac)}}{\text{Standing Height}}$; Females

T-Score	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.1331	.1319	.1295	.1269	.1235	.1196	.1202	.1215	.1228	.1240	.1223	.1191	.1161	.1129	.1122	.1114
5	.1361	.1349	.1327	.1303	.1272	.1237	.1244	.1257	.1271	.1284	.1270	.1240	.1211	.1181	.1174	.1167
10	.1390	.1379	.1358	.1337	.1309	.1278	.1285	.1299	.1314	.1328	.1316	.1289	.1261	.1233	.1226	.1220
15	.1420	.1409	.1390	.1371	.1346	.1319	.1327	.1341	.1357	.1372	.1363	.1338	.1311	.1285	.1278	.1273
20	.1449	.1439	.1421	.1405	.1383	.1360	.1368	.1383	.1400	.1416	.1409	.1387	.1361	.1337	.1330	.1326
25	.1479	.1469	.1453	.1439	.1420	.1401	.1410	.1425	.1443	.1460	.1456	.1436	.1411	.1389	.1382	.1379
30	.1508	.1499	.1484	.1473	.1457	.1442	.1451	.1467	.1486	.1504	.1502	.1485	.1461	.1441	.1434	.1432
35	.1538	.1529	.1516	.1507	.1494	.1483	.1493	.1509	.1529	.1548	.1549	.1534	.1511	.1493	.1486	.1485
40	.1567	.1559	.1547	.1541	.1531	.1524	.1534	.1551	.1572	.1592	.1595	.1583	.1561	.1545	.1538	.1538
45	.1597	.1589	.1579	.1575	.1568	.1565	.1576	.1593	.1615	.1636	.1642	.1632	.1611	.1597	.1590	.1591
50	.1626	.1619	.1610	.1609	.1605	.1606	.1617	.1635	.1658	.1680	.1688	.1681	.1661	.1649	.1642	.1644
55	.1656	.1649	.1642	.1643	.1642	.1647	.1659	.1677	.1701	.1724	.1735	.1730	.1711	.1701	.1694	.1697
60	.1685	.1679	.1673	.1677	.1679	.1688	.1700	.1719	.1744	.1768	.1781	.1779	.1761	.1753	.1746	.1750
65	.1715	.1709	.1705	.1711	.1716	.1729	.1742	.1761	.1787	.1812	.1828	.1828	.1811	.1805	.1798	.1803
70	.1744	.1739	.1736	.1745	.1753	.1770	.1783	.1803	.1830	.1856	.1874	.1877	.1861	.1857	.1850	.1856
75	.1774	.1769	.1768	.1779	.1790	.1811	.1825	.1845	.1873	.1900	.1921	.1926	.1911	.1909	.1902	.1909
80	.1803	.1799	.1799	.1813	.1827	.1852	.1866	.1887	.1916	.1944	.1967	.1975	.1961	.1961	.1954	.1962
85	.1833	.1829	.1831	.1847	.1864	.1893	.1908	.1929	.1959	.1988	.2014	.2024	.2011	.2013	.2006	.2015
90	.1862	.1859	.1862	.1881	.1901	.1934	.1949	.1971	.2002	.2032	.2060	.2073	.2061	.2065	.2058	.2068
95	.1892	.1889	.1894	.1915	.1938	.1975	.1991	.2013	.2045	.2076	.2107	.2122	.2111	.2117	.2110	.2121
100	.1921	.1919	.1925	.1949	.1975	.2016	.2032	.2055	.2088	.2120	.2153	.2171	.2161	.2169	.2162	.2174

Table 11

T-Scores for Hip Index $\frac{\text{Hip Width (Trochanter)}}{\text{Standing Height}}$: Males

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.1290	.1480	.1355	.1425	.1447	.1536	.1405	.1375	.1360	.1345	.1245	.1235	.1228	.1224	.1234	.1241	.1248	.1239	.1243	.1245	.1240	.1230
5	.1358	.1545	.1414	.1472	.1486	.1572	.1441	.1411	.1396	.1382	.1280	.1270	.1263	.1259	.1269	.1276	.1283	.1276	.1281	.1284	.1280	.1272
10	.1426	.1610	.1473	.1519	.1524	.1608	.1476	.1447	.1432	.1418	.1315	.1305	.1298	.1294	.1303	.1310	.1318	.1313	.1318	.1322	.1320	.1314
15	.1494	.1675	.1532	.1566	.1563	.1644	.1512	.1483	.1468	.1455	.1350	.1340	.1333	.1329	.1338	.1345	.1353	.1350	.1356	.1361	.1360	.1356
20	.1562	.1740	.1591	.1613	.1601	.1680	.1547	.1519	.1504	.1491	.1385	.1375	.1368	.1364	.1372	.1379	.1388	.1387	.1393	.1399	.1400	.1398
25	.1630	.1805	.1650	.1660	.1640	.1716	.1583	.1555	.1540	.1528	.1420	.1410	.1403	.1399	.1407	.1414	.1423	.1424	.1431	.1438	.1440	.1440
30	.1698	.1870	.1709	.1707	.1678	.1752	.1618	.1591	.1576	.1564	.1455	.1445	.1438	.1434	.1441	.1448	.1458	.1461	.1468	.1476	.1480	.1482
35	.1766	.1935	.1768	.1754	.1717	.1788	.1654	.1627	.1612	.1601	.1490	.1480	.1473	.1469	.1476	.1483	.1493	.1498	.1506	.1515	.1520	.1524
40	.1834	.2000	.1827	.1801	.1755	.1824	.1689	.1663	.1648	.1637	.1525	.1515	.1508	.1504	.1510	.1517	.1528	.1535	.1543	.1553	.1560	.1566
45	.1902	.2065	.1886	.1848	.1794	.1860	.1725	.1699	.1684	.1674	.1560	.1550	.1543	.1529	.1545	.1552	.1563	.1572	.1581	.1592	.1600	.1608
50	.1970	.2130	.1945	.1895	.1832	.1896	.1760	.1735	.1720	.1710	.1595	.1585	.1578	.1574	.1579	.1586	.1598	.1609	.1618	.1630	.1640	.1650
55	.2038	.2195	.2004	.1942	.1871	.1932	.1796	.1771	.1756	.1747	.1630	.1620	.1613	.1609	.1614	.1621	.1633	.1646	.1656	.1669	.1680	.1692
60	.2106	.2260	.2063	.1989	.1909	.1968	.1831	.1807	.1792	.1783	.1665	.1655	.1648	.1644	.1648	.1655	.1668	.1683	.1693	.1707	.1720	.1734
65	.2174	.2325	.2122	.2036	.1948	.2004	.1867	.1843	.1828	.1820	.1700	.1690	.1683	.1679	.1683	.1690	.1703	.1720	.1731	.1746	.1760	.1776
70	.2242	.2390	.2181	.2083	.1986	.2040	.1902	.1879	.1864	.1856	.1735	.1725	.1718	.1714	.1717	.1724	.1738	.1757	.1768	.1784	.1800	.1818
75	.2310	.2455	.2240	.2130	.2025	.2076	.1938	.1915	.1900	.1893	.1770	.1760	.1753	.1749	.1752	.1759	.1773	.1794	.1806	.1823	.1840	.1860
80	.2378	.2520	.2299	.2177	.2063	.2112	.1973	.1951	.1936	.1929	.1805	.1795	.1788	.1784	.1786	.1793	.1808	.1831	.1843	.1861	.1880	.1902
85	.2446	.2585	.2358	.2224	.2102	.2148	.2009	.1987	.1972	.1966	.1840	.1830	.1823	.1819	.1821	.1828	.1843	.1868	.1881	.1900	.1920	.1944
90	.2514	.2650	.2417	.2271	.2140	.2184	.2044	.2023	.2008	.2002	.1875	.1865	.1858	.1854	.1855	.1862	.1878	.1905	.1918	.1938	.1960	.1986
95	.2582	.2715	.2476	.2318	.2179	.2220	.2080	.2059	.2044	.2039	.1910	.1900	.1893	.1889	.1890	.1897	.1913	.1942	.1956	.1977	.2000	.2028
100	.2650	.2780	.2535	.2365	.2217	.2256	.2115	.2095	.2080	.2075	.1945	.1935	.1928	.1924	.1924	.1931	.1948	.1979	.1993	.2015	.2040	.2070

These indices have all been used in the prediction of types of build. While, in our opinion, they are not as useful as the Normal Ponderal Index and the Vital Index (as was implied in the data presented in Chapter II of *Appraising Physical Status: The Selection of Measurements*), they may be useful for special investigations, and norms are given for these in Tables 5 to 12. To use the Hip-Height Index, the widths should be corrected for fat (See Chapter V).

These miscellaneous tables may well be used when observation shows an individual who is an atypical or mixed type. Comparisons of the Shoulder Index, the Vital Index, and the Hip-Height Index throw light upon the difficulties of predictions by other norms.

It will be seen that no attempt has been made to divide build into discrete types, such as asthenic, athletic, or pyknic. As was explained in detail in Chapter II of *Appraising Physical Status: The Selection of Measurements* (40), it is felt that the evidence from our studies shows that these "types" correspond to imaginary entities only, and are simply small sections of a continuous distribution removed from the rest of the population and viewed "out of their context," as it were. Since the evidence seems to favor the idea of one continuous distribution of build, in so far as standards

Table 12

T-Scores for Hip Index $\frac{\text{Hip Width (Trochanter)}}{\text{Standing Height}}$: Females

T-Score	2 Days	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years
0	.1450	.1450	.1440	.1440	.1440	.1400	.1345	.1270	.1230	.1220
5	.1507	.1504	.1492	.1486	.1480	.1441	.1390	.1322	.1285	.1277
10	.1564	.1558	.1543	.1532	.1520	.1482	.1434	.1373	.1340	.1333
15	.1621	.1612	.1595	.1578	.1560	.1523	.1479	.1425	.1395	.1390
20	.1678	.1666	.1646	.1624	.1600	.1564	.1523	.1476	.1450	.1446
25	.1735	.1720	.1698	.1670	.1640	.1605	.1568	.1528	.1505	.1503
30	.1792	.1774	.1749	.1716	.1680	.1646	.1612	.1579	.1560	.1559
35	.1849	.1828	.1801	.1762	.1720	.1687	.1657	.1631	.1615	.1616
40	.1906	.1882	.1852	.1808	.1760	.1728	.1701	.1682	.1670	.1672
45	.1963	.1936	.1904	.1854	.1800	.1769	.1746	.1734	.1725	.1729
50	.2020	.1990	.1955	.1900	.1840	.1810	.1790	.1785	.1780	.1785
55	.2077	.2044	.2007	.1946	.1880	.1851	.1835	.1837	.1835	.1842
60	.2134	.2098	.2058	.1992	.1920	.1892	.1879	.1888	.1890	.1898
65	.2191	.2152	.2110	.2038	.1960	.1933	.1924	.1940	.1945	.1955
70	.2248	.2206	.2161	.2084	.2000	.1974	.1968	.1991	.2000	.2011
75	.2305	.2260	.2213	.2130	.2040	.2015	.2013	.2043	.2055	.2068
80	.2362	.2314	.2264	.2176	.2080	.2056	.2057	.2094	.2110	.2124
85	.2419	.2368	.2316	.2222	.2120	.2097	.2102	.2146	.2165	.2181
90	.2476	.2422	.2367	.2268	.2140	.2138	.2146	.2197	.2220	.2237
95	.2533	.2476	.2419	.2314	.2200	.2179	.2191	.2249	.2275	.2294
100	.2590	.2530	.2470	.2360	.2240	.2220	.2235	.2300	.2330	.2350

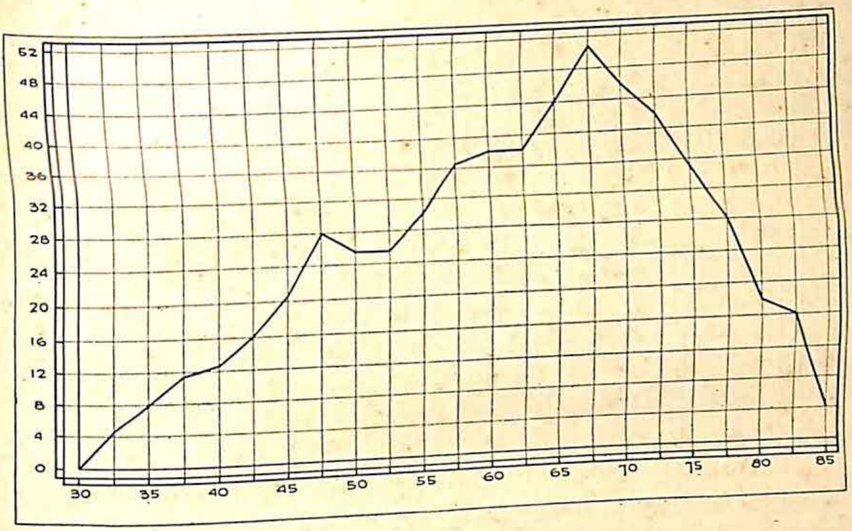

Figure 1. Index D:

$$\frac{\text{(Shoulder Breadth x Hand Circumference x Arm Length x Leg Length)}}{\text{(Chest Circumference x Abdominal Girth) x 10}}$$

of nutritional status are concerned, it is felt that the statement of build in terms of standard deviations from the mean will be as satisfactory as any other method. This does not in any way deny the possibility of there being separate types which are relatively

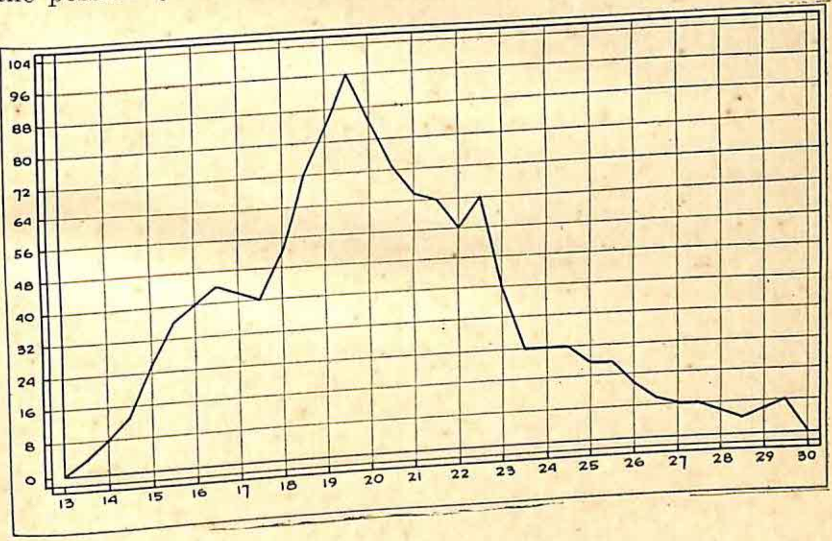

Figure 2. Index B:

$$\frac{\text{Height x 100}}{\text{Shoulder Breadth x Trunk Length x Chest Depth x Chest Breadth}}$$

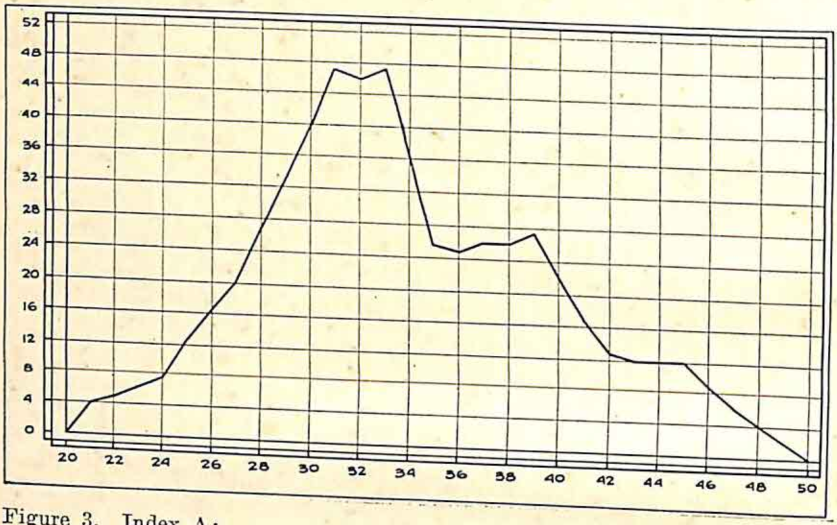

Figure 3. Index A:

$$\frac{\text{Head Height x Hand Circumference x Shoulder Breadth x Chest Breadth}}{10{,}000}$$

specific to disease groups, such as those proposed by Draper (19).

Evidence for the statements made above concerning the nature of the essential continuousness of the distributions of body build indices proposed for the division into discrete types is seen in

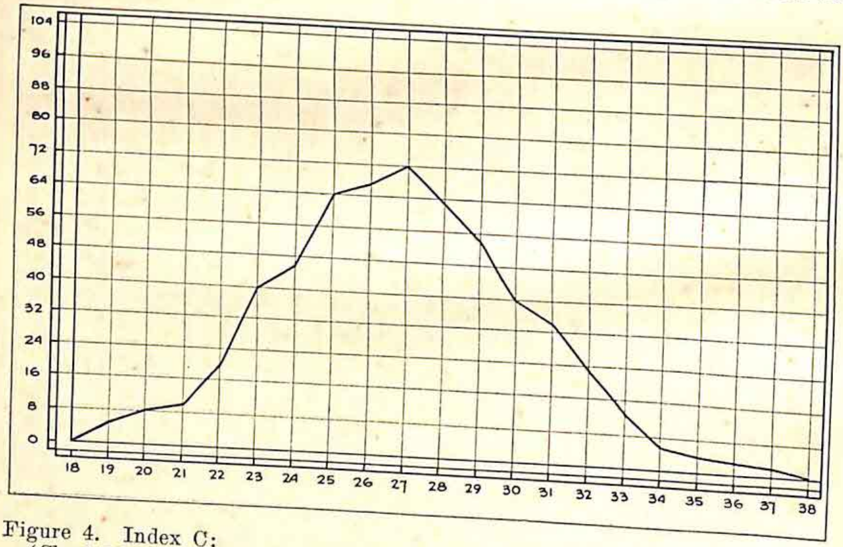

Figure 4. Index C:

$$\frac{\text{(Chest Depth x Chest Breadth x Shoulder Breadth)}}{\text{(Bi-iliac x Bi-trochanteric hip widths) x 10}}$$

Figures 1 to 4, in which a whole random sample has been plotted. It will be seen that while somewhat skewed in some cases, the distributions are continuous, and give no evidence of falling into two or three clear-cut divisions. For a further discussion of these indices, see *Appraising Physical Status: The Selection of Measurements* (p. 20-24) and Kühnel (32).

CHAPTER III

THE ANTHROPOMETRIC MEASUREMENT OF NUTRITIONAL STATUS

The term *nutritional status* has been used with many different shades of meaning. It is used most frequently to denote the general conditions of the body with reference to the relative normality of its growth, development, and repair of the excess breaking down of tissues associated with work or disease. Others would add the much more qualitative conditions—the status of phosphorous and nitrogen metabolism, the vitamin content of diet, and perhaps the influence of some of the glands of internal secretion. Consequently, there are at least two quite distinct approaches to this problem of the measurement of nutritional status.

One approach would be that made in the chemical laboratory. Here the nitrogen balance, the phosphorous and calcium retentions, the purin content of the excretions, and chemical analyses of fecal materials might be accurately determined and checked against the metabolic rate. Yet it might be true that while chemically the individual seemed quite normal, he might not be nutritionally normal in other ways. This kind of determination of nutritional status must, of necessity, be largely limited to laboratory studies for purposes of research, and even here would not present a complete picture.

A second method, more in accord with the popular conceptions of nutrition, is to measure the more *quantitative* aspects of growth and development. In this approach it is assumed that if the individual is growing well; is "up to normal" in weight, bulk of fatty tissue, and development or bulk of muscular tissues; and if he functions well and has no definite diseased conditions (either general or diseases associated with malnutrition, such as rickets, anaemia, chlorosis, etc.), that his nutritional status is satisfactory. In this method of judgment the qualitative chemical standards are disregarded, as are subjectively judged qualitative differences in the consistency of fat or muscular tissue. While this method does not give a complete analysis of all factors determining nutritional status, it is convenient, inexpensive of time and money, and reasonably satisfactory, particularly for rapid work with large groups, such as is demanded in public school situations.

In the usual medical appraisal of general condition, the physician first seeks to find all positive diseased conditions. These are recorded and evaluated. He then "sizes up" the individual and makes an educated guess as to his general qualitative condition and his nutritional status. This guess is based almost solely upon common sense and experience (much of it with the physically sub-normals who patronize the physicians in larger numbers than do those in superb condition), and very little on objective findings, except where there are some possible pathological conditions, which, of course, influence the physician's judgment. Hence, even in the examination by a medical scientist, much of the determination of *nutritional status* is subjective and based on appearance. However, the methods of subjective estimation should not be discarded entirely, as items such as the condition of the hair, the brightness of the eyes, the pinkness of the nails and mucuous membranes, good posture, soundness of teeth, and general condition of the skin all aid in the judgment of the individual. It has been found, however, that even trained pediatricians fail to agree upon nutritional condition when using these subjective criteria alone (23). It has been further found in unpublished researches made at this Station that physicians' subjective estimates of the amount of subcutaneous fat and muscle correlate very poorly with the amounts actually found by objective measurement. This would seem to indicate the need for more objective standards. Since the appraisal of nutrition from the chemical laboratory is not usually feasible in most social situations, we propose that this second method, the objective measurement of the growth and developmental *results* of the nutritional process, be adopted for more widespread use both by physicians to supplement their medical findings and by lay social agencies. While this kind of measurement and its application still presents problems of interpretation, it is a great advance on the usual substitute for such measurement, mere subjective estimation.

For the purpose of thus measuring nutritional status, five approaches are suggested. These will be briefly discussed in turn. It is not necessary to use all of these methods, and certain short-cuts will be suggested.

1. Weight Relative to Normal Weight: For centuries medical experience has shown that, with the exception of a small percentage of individuals exhibiting certain forms of glandular unbalance, persons whose body weight is normal or slightly above normal for their

skeletal framework are relatively more healthy and certainly better nourished; while the underweight are usually not as healthy and are frequently undernourished. For this reason, relative over- or underweight is suggested as one criterion of normality of nutritional status. This is, perhaps, the most easily understood criterion, and one simple to administer. (See Chapter IV)

2. The Relative Amount of Subcutaneous Fat: Subcutaneous fat, while not a measure of all of the fat in the body, correlates very highly with it. The physiologically normal amount of fat for each individual is hard to determine (See *Appraising Physical Status: The Selection of Measurements* (40), Chapter V), and the amount found should be interpreted in the light of other findings. On the other hand, a relatively normal amount of fat should be found in all persons who are reasonably well-nourished. Where this is not found, there is usually some physiological abnormality (as an overly high basal metabolic rate) or some pathological condition. Hence, the relative amount of fat is an important item in the estimation of nutritional status.

3. The Relative Development of the Musculature: This is measured in two ways:

a. The Relative Size of Limb Girths. These are judged in relationship to the size of the trunk and the elbow or knee. (See Vol. I, Chap. VI). These measurements of girth of upper arm, forearm, thigh, and calf are, of course, determined by: (1) the size of bone, which is highly correlated with the size of chest and the width of elbow (upper limb measurements) or width of knee (lower limb measurements); (2) the size and development of the muscles; and (3) the fat overlying the muscles. Hence, the girths, relative to the girth normal for a person of that age, sex, size, and build, are not strictly measurements of the development of muscles alone, but it has been found that such limb girths are excellent measurements of nutritional status (23). It has been further found that the girth of upper arm alone, relative to the norm, is an excellent substitute for the average of the four girths, and may be used when it is administratively impossible to find the time to use the larger number of measurements, or when for any other reason only the arm may be measured. In each case, the measurement taken is the actual girth divided by or in other ways compared with the *normal girth* for that individual. For the samples studied, these limb girths correlate higher with over- and underweight than does the relative amount of subcutaneous fat.

b. The Relative Amount of Strength. The second method of judging the relative development of the musculature is actually to test the strength of the muscles. This is very much superior to the method described above, but the expense of the necessary equipment and of time combine to render it impracticable in many situations. The strength tests apparatus costs about $100, and the tests take considerable time to administer. The results are, however, much more useful. The evidence seems to indicate that this method is definitely superior to any other one method for the purpose of indicating general development and nutritional status. Norms are at present limited to ages from nine to twenty-five.

4. The Breathing Capacity of the Lungs: This final device used is an indirect one, but is useful for judging nutritional status when used to supplement information gained from other methods. This measurement is that of the breathing capacity of the lungs.

For those of the same general socio-economic level and having the same general habits of activity (that is, not contrasting outdoor laborers with sedentary workers), there seems to be no significant relationship between over- and underweight and over and under breathing capacity. For two samples, the following correlations were obtained:

Age, Years	Sex	Correlation
11	Boys	−.096 ± .067
16	Boys	−.121 ± .069

There is a slightly better correlation between breathing capacity and muscular strength. Van Dalen (65) in a study of 238 twelve-year-old and 227 seventeen-year-old boys found correlations of .202 and .221 respectively between breathing capacity over and under the norm and the physical fitness index, which gives proportionate over and under strength for age and weight, computed only from strength items. This is not a particularly striking relationship.

Each of these devices mentioned above will be discussed in the chapters immediately following. The general integration of this information and the methods of administering it in a school situation will be discussed in Chapters XI and XII.

CHAPTER IV

THE PREDICTION OF NORMAL WEIGHT

As was discussed in Chapters II and IV of *Appraising Physical Status: The Selection of Measurements* normal weight must of necessity be an individual matter correlated with the body build of the person concerned. The person of any given age who has inherited a slender, linear skeletal build will have a normal weight less than that of an individual of the same age and height who has inherited a larger boned, stockier build. In the study referred to above it was found that normal weight was best predicted at all ages from four measurements, height, chest circumference (corrected for fat), hip width (corrected for fat), and knee width. After the chest circumference and hip width have been corrected for fat, the tables for computing the normal weight are made from multiple regression formulae, which are presented on page 38 of this study.

CORRECTIONS FOR FAT

1. Corrections of chest girth for variations in fat: To make the method used clear, let us imagine a chest with the normal or average amount of fat, between the thoracic walls and the skin, for one standard sample of people. Suppose the chest had a circumference of 80 cms. Now let us assume that the individual accumulates a layer of fat that averages 2 cms. in thickness all around. This would increase the average diameters in all directions 4 cms. (2 cms. at the end of each radius). Hence the circumference would be increased π x 4 cms. or 12.6 cms.

It is this principle which is used in "correcting" the chest girth for variations in fatness. Two measurements are taken, one on the front of the chest and one on the back of the chest at the level crossed by the tape in taking the girth measurement. Each of these is a double thickness. Hence the sum of this pair of double measurements represents twice the average variation in diameter. Therefore, the correction is made by multiplying one-half the difference between the sum of these two chest fat measurements and the average sum for each given age by π. This formula would be:

Correction =

$$\pi\left(\frac{\text{Sum of fat measurements} - \text{average sum of fat measurements}}{2}\right)$$

This correction is subtracted from the actual chest girth if it is positive, or added if it is negative. Tables for "correcting" chest circumference will be found in the Appendix (Table 20). For example: In a twenty-year-old female, the measurements were as follows:

Measurement	Cms.
Chest girth	72
Front chest fat	2.4
Back chest fat	3.2
Sum of chest fat	5.6
Average sum of chest fat for twenty-year-olds	4.4
Difference	1.2

$$1/2 \times 1.2 \times \pi = 1.885$$

72 — 1.9 — 70.1 cms. corrected chest girth

This is approximately the girth as it would be if the individual had possessed only the average amount of fat around her chest.[1]

In a rather small number of individuals, it is difficult to pick up the fold of skin on the front of the chest. In such cases, the reading of the "abdomen" measurement (halfway between the left nipple and the umbilicus) is substituted. Since this measurement usually runs larger than the chest front measurement, it must be corrected before substitution. Such corrections are found in the following tabulation:

Values for "Chest Front" as Computed from "Abdomen" (Fat Measurements)

Fat Measurement			Fat Measurement		
Abdomen	Chest Front		Abdomen	Chest Front	
	Males	Females		Males	Females
11	11	11	26	22	20
12	12	11	27	23	21
13	12	12	28	23	21
14	13	12	29	24	22
15	14	13	30	25	23
16	15	14	31	26	23
17	15	14	32	26	24

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[1] Fat calipers now in use start at 6 mms. This is of no importance when only deviations from the average are to be considered. This is because the caliper frame was originally used for measuring the inside diameter of a pipe and has been adapted to use as fat calipers, retaining the old calibrations.

Values for "Chest Front" as Computed from "Abdomen" (Fat Measurements)

Fat Measurement			Fat Measurement		
Abdomen	Chest Front		Abdomen	Chest Front	
	Males	Females		Males	Females
18	16	15	33	27	24
19	17	16	34	28	25
20	18	16	35	29	26
21	18	17	36	29	26
22	19	17	37	30	27
23	20	18	38	31	28
24	21	19	39	31	28
25	21	19	40	32	29

2. Corrections of hip width for variations in fat: Standards for correcting the bi-cristal hip width for variations in fatness were devised from X-ray studies. The subjects studied were X-rayed lying supine, with the metal calipers applied to the crests of the ilia with the ordinary amount of pressure, and with the blade of the caliper in line with the central rays. The distance between the blade and the bone was easily measurable, and these measurements were corrected for distortion. The supra-iliac fat measurement was also taken.

The distance between bone and calipers was plotted against the supra-iliac fat measurement, and a line of best fit computed. This was at first done separately for males and females. Since, however, the difference between the regression lines for the two sexes was

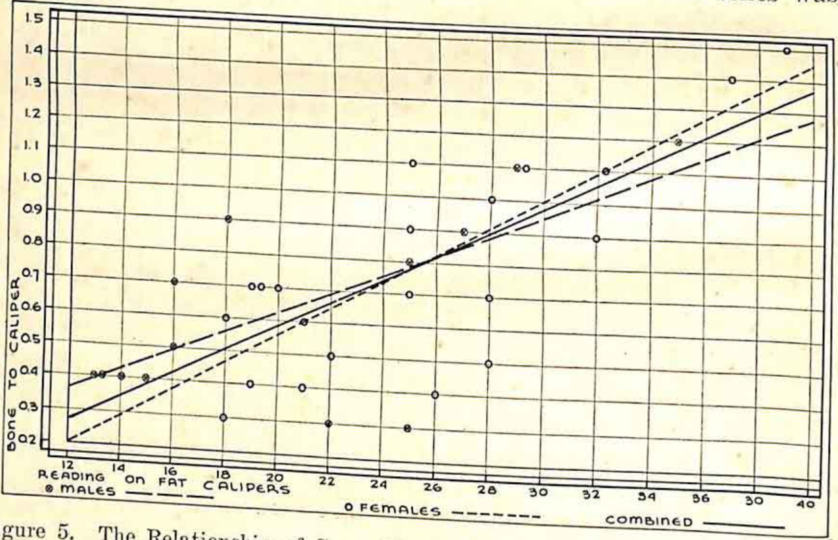

Figure 5. The Relationship of Supra-iliac Fat to Distances From Calipers to Ilium

well within the sampling error, and since there was no reason to expect that there should be a sex difference in the reaction of fat to caliper pressure, the two groups were combined. Only adult subjects were studied. The plottings are shown in Figure 5. It is realized that the number of subjects used is small, but the slight gain in accuracy that would have been achieved from more subjects did not seem to justify the expense. In computing the norms, the average supra-iliac fat measurement for each age of each sex was considered as standard. Variations above and below this average were given the correction values that correspond to the values in our two experimental groups. Tables for "correcting" hip width for the different ages of each sex are found in the Appendix (Table 21).

It is very probable that errors of some magnitude may occur in attempting to correct the chest and hip measurements of the corpulent. It is equally probable, however, that the errors in correcting hip width in the undernourished will be negligible, and it is this group that it is most important to predict with the greatest accuracy. One is not apt to err in correcting the hip width of the obese sufficiently to make an error of prediction greater than one kilogram in adults, or half a kilogram in the younger children. In determining the amount of overweight, that is of small importance. The errors would be as much or more due to the difficulties of picking up a double fold of skin and fat, particularly in those who are at the time growing fatter, and hence would have tenser skins, than it would be due to inaccuracies in the standards. For further comment on this subject, see also page 49 where methods of meeting this difficulty are proposed.

THE COMPUTATION OF NORMAL WEIGHT

The normal weight in the vast majority of individuals can be computed accurately, as was stated above, by a multiple regression equation from measurements of total standing height, circumference of chest (corrected for fat), bi-cristal width of the hips (corrected for fat), and the width of the knee at the epicondyles. A multiple regression equation is simply an algebraic equation of the form: $\tilde{\omega} = ax_1 + bx_2 + cx_3 + dx_4 + K$, in which $\tilde{\omega}$ = normal weight as predicted by equation, x_1 = height, x_2 = chest girth, x_3 = hip width, x_4 = knee width, and K = a constant. K, a, b, c, and d, are mathematically determined constants of such magnitudes that, when the anthropometric variables are multiplied by them, the correlation between the resultant normal weight and the criterion (in this case the actual weight) would be a maximum.

In the case of weight prediction, these equations were computed for each age of each sex, first using the actual chest girth and the actual hip width (uncorrected for fat variations). This procedure assumed that we were attempting to predict actual weight from actual measurements. Thus a person who is somewhat fat would simply represent a somewhat more stockily built person of normal weight (for his build). These equations, when used with corrected chest girth and hip width, will then predict the normal weight for the person to within the limitations of the equation. These equations were given in Table 13, and as will be seen from the multiple correlations given, the correlations are high.

Table 13

Prediction Equations of Weight (Kilograms) from Height, Hips, Chest Circumference and Knee (Centimeters)

Age, Years	Equation
	Boys
4	Weight = .1315 Height + .3082 Hips +.2339 Chest Cir.* +1.7623 Knee - 26.7253 R = .9124 N = 69
5	Weight = .1128 Height + .1961 Hips +.3951 Chest Cir. +1.6586 Knee - 30.2065 R = .9100 N = 146
6	Weight = .1912 Height + .3785 Hips +.5907 Chest Cir. + .7245 Knee - 46.4538 R = .9224 N = 149
7	Weight = .1293 Height + .6199 Hips +.4890 Chest Cir. +1.3739 Knee - 42.9970 R = .9042 N = 135
8	Weight = .1607 Height + .4028 Hips +.6789 Chest Cir. +2.1453 Knee - 60.2709 R = .9247 N = 115
9	Weight = .1906 Height + .5886 Hips +.5477 Chest Cir. +1.9372 Knee - 58.4834 R = .9237 N = 137
10	Weight = .2183 Height + .2743 Hips +.7577 Chest Cir. +2.1438 Knee - 70.5147 R = .9180 N = 138
11	Weight = .2297 Height + .1934 Hips +.5615 Chest Cir. +3.1072 Knee - 66.1434 R = .9011 N = 132
12	Weight = .2230 Height + .2457 Hips +.5204 Chest Cir. +5.7727 Knee - 69.7569 R = .8960 N = 129
13	Weight = .2476 Height + .0812 Hips +.8151 Chest Cir. +4.2135 Knee - 93.4790 R = .9682 N = 131
14	Weight = .2712 Height + .7361 Hips +.7935 Chest Cir. +3.1487 Knee -101.9942 R = .9573 N = 141
15	Weight = .3008 Height + .9060 Hips +.6489 Chest Cir. +4.3726 Knee -111.8544 R = .9500 N = 126
16	Weight = .2808 Height + .6960 Hips +.7840 Chest Cir. +5.0191 Knee -119.3305 R = .9196 N = 107
17	Weight = .2897 Height + .7082 Hips +.7270 Chest Cir. +5.0149 Knee -115.2652 R = .9233 N = 78
18	Weight = .2359 Height +1.1402 Hips +.9641 Chest Cir. +2.4796 Knee -112.7968 R = .8946 N = 266
	Girls
4	Weight = .1298 Height + .3304 Hips +.4819 Chest Cir.* + .7320 Knee - 32.0832 R = .9636 N = 70
5	Weight = .1502 Height + .3327 Hips +.4730 Chest Cir. +1.1673 Knee - 36.9006 R = .9442 N = 151
6	Weight = .1053 Height + .2633 Hips +.5137 Chest Cir. +1.6253 Knee - 35.3942 R = .8972 N = 110

Table 13 (Continued)

Prediction Equations of Weight (Kilograms) from Height, Hips, Chest Circumference and Knee (Centimeters)

Age, Years	Equation
	Girls
7	Weight = .1945 Height + .3750 Hips +.6070 Chest Cir.* +1.2585 Knee - 50.9433 R = .9340 N = 100
8	Weight = .1798 Height + .1687 Hips +.5505 Chest Cir. +2.1443 Knee - 48.2626 R = .9077 N = 102
9	Weight = .1391 Height + .3127 Hips +.7506 Chest Cir. +1.9510 Knee - 56.6639 R = .9481 N = 114
10	Weight = .0966 Height + .7730 Hips +.7034 Chest Cir. +2.4933 Knee - 61.8757 R = .9316 N = 124
11	Weight = .1593 Height + .8849 Hips +.5217 Chest Cir. +2.3366 Knee - 60.2732 R = .9385 N = 132
12	Weight = .1234 Height +1.0364 Hips +.6959 Chest Cir. +3.3690 Knee - 78.0477 R = .9289 N = 151
13	Weight = .1337 Height +1.4422 Hips +.4933 Chest Cir. +4.3232 Knee - 83.9531 R = .9279 N = 164
14	Weight = .2170 Height + .8422 Hips +.6187 Chest Cir. +3.7842 Knee - 84.4909 R = .9041 N = 146
15	Weight = .1546 Height + .7290 Hips +.5870 Chest Cir. +4.7586 Knee - 77.6805 R = .8480 N = 136
16	Weight = .1347 Height +1.0977 Hips +.5353 Chest Cir. +4.8507 Knee - 82.2678 R = .8749 N = 113
17	Weight = .1233 Height +1.0291 Hips +.4985 Chest Cir. +3.7574 Knee - 64.6120 R = .8729 N = 97
18	Weight = .3165 Height + .6508 Hips +.8041 Chest Cir. +3.6080 Knee.-105.23 R = .9275 N = 214

*Chest circumference corrected for fat.

In predicting normal weight, it would be time-consuming to compute each weight from the equations themselves. Tables have therefore been computed for this purpose, and are found in Appendix (Tables 22 to 81). In these tables, the four variables are combined, together with the constant, into two tables, and when the two numbers obtained from the two tables are added, the normal weight is the result obtained. Directions for using the tables will be found on page 124-127.

Abnormalities of Build and Their Effect on the Prediction of Normal Weight

If all individuals were consistent in build, the multiple correlations with these formulae would be almost plus 1.00. Such is not the case, and in a number of cases certain allowances for deviations from what we may call "biological consistency" must be made.

Perhaps the term "biological consistency" should be defined and illustrated. It has been stated above that there are wide variations in build running from the extreme of the very slender linear type to the very stocky lateral type. In the average person of each "degree of build," we have an individual whose various body parts are relatively harmonious to that build. This we have chosen to call "biological consistency." In other persons, one or more parts of the body may be out of harmony with the rest. A person may have a long stocky trunk, but instead of having the relatively short thick limbs that usually go with that kind of trunk, he may have thin limbs, both in external dimensions and in size and coarseness of bones. The predicted weight of such a person will differ somewhat from the average for his dimensions, even though the width of knee is included in the equation. This does not in all such cases compensate for the whole slender limb development. The build of such an individual is "biologically inconsistent," and some allowance must be made for it.

Such inconsistencies of build are of several types:

1. Abnormal shapes of chest: The weight may be affected by differences in the shape of the thorax. The normal chest shape is usually measured by the chest index $100 \times \frac{\text{Chest Depth}}{\text{Chest Width}}$. T-scores for each age and sex are given in Tables 14 to 15. In cases where the chest indices differ markedly from these average proportions, some effect on the weight will be found. The rationale of this will be seen in the following analogy.

Suppose we consider the areas of three figures as follows:

a. A circle with a diameter of 25 cms.

b. Two semicircles with a diameter of 20 cms. separated by a rectangle 20 cms. x 7.854 cms.

c. Two semicircles with a diameter of 15 cms. separated by a rectangle 15 cms. x 15.708 cms.

The perimeters or "chest girths" will all be the same, namely, 78.54 cms. The areas, however, will be approximately 481, 471, and 412 square cms. respectively. This would correspond to "chest indices" of 100, 71.8, and 48.9. In other words, chests of the same perimeter may vary in cross section if the shape varies. Corrections for this were devised by correlating the chest index against the amount of under- and overweight and deriving a correcting equation from the regression equation. This equation is: $Y = .2$ (chest index) $+ .867$, where Y is a value by which the over- or underweight percentage is to be divided to give the corrected normal weight. In actual practice, differences in chest shape have very little influence on the weight predicted, but in extreme cases this correction may be used.

Table 14

T-Scores for Chest Index $\frac{\text{Chest Depth}}{\text{Chest Width}}$: Males

T-Score	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.5030	.4850	.4865	.4980	.5215	.5265	.5280	.5260	.5220	.5155	.5025	.4870	.4765	.4725	.4810	.4760	.4580	.4415	.4425	.4640	.4730
5	.5345	.5150	.5136	.5224	.5435	.5480	.5490	.5468	.5429	.5369	.5248	.5104	.5005	.4965	.5039	.4995	.4829	.4682	.4695	.4893	.4978
10	.5660	.5450	.5406	.5468	.5654	.5694	.5700	.5676	.5638	.5582	.5470	.5338	.5244	.5204	.5268	.5230	.5078	.4948	.4964	.5146	.5226
15	.5975	.5750	.5677	.5712	.5874	.5909	.5910	.5884	.5847	.5796	.5693	.5572	.5484	.5444	.5497	.5465	.5327	.5215	.5234	.5399	.5474
20	.6290	.6050	.5947	.5956	.6093	.6123	.6120	.6092	.6056	.6009	.5915	.5806	.5723	.5683	.5726	.5700	.5576	.5481	.5503	.5652	.5722
25	.6605	.6350	.6218	.6200	.6313	.6338	.6330	.6300	.6265	.6223	.6138	.6040	.5963	.5923	.5955	.5935	.5825	.5748	.5773	.5905	.5970
30	.6920	.6650	.6488	.6444	.6532	.6552	.6540	.6508	.6474	.6436	.6360	.6274	.6202	.6162	.6184	.6170	.6074	.6014	.6042	.6158	.6218
35	.7235	.6950	.6759	.6688	.6752	.6767	.6750	.6716	.6683	.6650	.6583	.6508	.6442	.6402	.6413	.6405	.6323	.6281	.6312	.6411	.6466
40	.7550	.7250	.7029	.6932	.6971	.6981	.6960	.6924	.6892	.6863	.6805	.6742	.6681	.6641	.6642	.6640	.6572	.6547	.6581	.6664	.6714
45	.7865	.7550	.7300	.7176	.7191	.7196	.7170	.7132	.7101	.7077	.7028	.6976	.6921	.6881	.6871	.6875	.6821	.6814	.6851	.6917	.6962
50	.8180	.7850	.7570	.7420	.7410	.7410	.7380	.7340	.7310	.7290	.7250	.7210	.7160	.7120	.7100	.7110	.7070	.7080	.7120	.7170	.7210
55	.8495	.8150	.7841	.7664	.7630	.7625	.7590	.7548	.7519	.7504	.7473	.7444	.7400	.7360	.7329	.7345	.7319	.7347	.7390	.7423	.7458
60	.8810	.8450	.8111	.7908	.7849	.7839	.7800	.7756	.7728	.7717	.7695	.7678	.7639	.7599	.7558	.7580	.7568	.7613	.7659	.7676	.7706
65	.9125	.8750	.8382	.8152	.8069	.8054	.8010	.7964	.7937	.7931	.7918	.7912	.7879	.7839	.7787	.7815	.7817	.7880	.7929	.7929	.7954
70	.9440	.9050	.8652	.8396	.8288	.8268	.8220	.8172	.8146	.8144	.8140	.8146	.8118	.8078	.8016	.8050	.8066	.8146	.8198	.8182	.8202
75	.9755	.9350	.8923	.8640	.8508	.8483	.8430	.8380	.8355	.8358	.8363	.8380	.8358	.8318	.8245	.8285	.8315	.8413	.8468	.8435	.8450
80	1.0070	.9650	.9193	.8884	.8727	.8697	.8640	.8588	.8564	.8571	.8585	.8614	.8597	.8557	.8474	.8520	.8564	.8679	.8737	.8688	.8698
85	1.0385	.9950	.9464	.9128	.8947	.8912	.8850	.8796	.8773	.8785	.8808	.8848	.8837	.8797	.8703	.8755	.8813	.8946	.9007	.8941	.8946
90	1.0700	1.0250	.9734	.9372	.9166	.9126	.9060	.9004	.8982	.8998	.9030	.9082	.9076	.9036	.8932	.8990	.9062	.9212	.9276	.9194	.9194
95	1.1015	1.0550	1.0005	.9616	.9386	.9341	.9270	.9212	.9191	.9212	.9253	.9316	.9316	.9276	.9161	.9225	.9311	.9479	.9546	.9447	.9442
100	1.1330	1.0850	1.0275	.9860	.9605	.9555	.9480	.9420	.9400	.9425	.9475	.9550	.9555	.9515	.9390	.9460	.9560	.9745	.9815	.9700	.9690

Table 15

T-Scores for Chest Index $\frac{\text{Chest Depth}}{\text{Chest Width}}$; Females

T-Score	6 Months	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.5280	.5055	.5285	.5365	.5285	.5235	.5135	.5110	.4970	.4795	.4690	.4715	.4735	.4710	.4625	.4500	.4435	.4405	.4430	.4060	.4010
5	.5580	.5338	.5518	.5568	.5483	.5433	.5343	.5320	.5195	.5038	.4945	.4968	.4983	.4960	.4883	.4765	.4703	.4673	.4695	.4365	.4320
10	.5880	.5620	.5750	.5770	.5680	.5630	.5550	.5530	.5420	.5280	.5200	.5220	.5230	.5210	.5140	.5030	.4970	.4940	.4960	.4670	.4630
15	.6180	.5903	.5983	.5973	.5878	.5828	.5758	.5740	.5645	.5523	.5455	.5473	.5478	.5460	.5398	.5295	.5238	.5208	.5225	.4975	.4940
20	.6480	.6185	.6215	.6175	.6075	.6025	.5965	.5950	.5870	.5765	.5710	.5725	.5725	.5710	.5655	.5560	.5505	.5475	.5490	.5280	.5250
25	.6780	.6468	.6448	.6378	.6273	.6223	.6173	.6160	.6095	.6008	.5965	.5978	.5973	.5960	.5913	.5825	.5773	.5743	.5755	.5585	.5560
30	.7080	.6750	.6680	.6580	.6470	.6420	.6380	.6370	.6320	.6250	.6220	.6230	.6220	.6210	.6170	.6090	.6040	.6010	.6020	.5890	.5870
35	.7380	.7033	.6913	.6783	.6668	.6618	.6588	.6580	.6545	.6493	.6475	.6483	.6468	.6460	.6428	.6355	.6308	.6278	.6285	.6195	.6180
40	.7680	.7315	.7145	.6985	.6865	.6815	.6795	.6790	.6770	.6735	.6730	.6735	.6715	.6710	.6685	.6620	.6575	.6545	.6550	.6500	.6490
45	.7980	.7598	.7378	.7188	.7063	.7013	.7003	.7000	.6995	.6978	.6985	.6988	.6963	.6960	.6943	.6885	.6843	.6813	.6815	.6805	.6800
50	.8280	.7880	.7610	.7390	.7260	.7210	.7210	.7210	.7220	.7220	.7240	.7240	.7210	.7210	.7200	.7150	.7110	.7080	.7080	.7110	.7110
55	.8580	.8163	.7843	.7593	.7458	.7408	.7418	.7420	.7445	.7463	.7495	.7493	.7458	.7460	.7458	.7415	.7378	.7348	.7345	.7415	.7420
60	.8880	.8445	.8075	.7795	.7655	.7605	.7625	.7630	.7670	.7705	.7750	.7745	.7705	.7710	.7715	.7680	.7645	.7615	.7610	.7720	.7730
65	.9180	.8728	.8308	.7998	.7853	.7803	.7833	.7840	.7895	.7948	.8005	.7998	.7953	.7960	.7973	.7945	.7913	.7883	.7875	.8025	.8040
70	.9480	.9010	.8540	.8200	.8050	.8000	.8040	.8050	.8120	.8190	.8260	.8250	.8200	.8210	.8230	.8210	.8180	.8150	.8140	.8330	.8350
75	.9780	.9293	.8773	.8403	.8248	.8198	.8248	.8260	.8345	.8433	.8515	.8503	.8448	.8460	.8488	.8475	.8448	.8418	.8405	.8635	.8660
80	1.0080	.9575	.9005	.8605	.8445	.8395	.8455	.8470	.8570	.8675	.8770	.8755	.8695	.8710	.8745	.8740	.8715	.8685	.8670	.8940	.8970
85	1.0380	.9858	.9238	.8808	.8643	.8593	.8663	.8680	.8795	.8918	.9025	.9008	.8943	.8960	.9003	.9005	.8983	.8953	.8935	.9245	.9280
90	1.0680	1.0140	.9470	.9010	.8840	.8790	.8870	.8890	.9020	.9160	.9280	.9260	.9190	.9210	.9260	.9270	.9250	.9220	.9200	.9550	.9590
95	1.0980	1.0423	.9703	.9213	.9038	.8988	.9078	.9100	.9245	.9403	.9535	.9513	.9438	.9460	.9518	.9535	.9518	.9488	.9465	.9855	.9900
100	1.1280	1.0705	.9935	.9415	.9235	.9185	.9285	.9310	.9470	.9645	.9790	.9765	.9685	.9710	.9775	.9800	.9785	.9755	.9730	1.0160	1.0210

2. Builds that resemble those of the opposite sex: Anthropometrically speaking, "masculine" and "feminine" are relative terms. In general, the major physical sex differences of averages for the sexes are given below. All statements of size of dimensions are relative to height. Thus "narrower shoulders" means narrower relative to height.

Measurement	Male	Female
Trunk	Shorter	Longer
Limbs	Longer	Shorter
Shoulders	Wider	Narrower
Chest	Larger	Smaller
Hips (at trochanters)	Narrower	Wider
Elbow	Wider	Narrower
Upper limbs	Larger	Smaller
Thigh	Smaller	Larger
Breathing capacity	Larger	Smaller
General subcutaneous fat	Less	More
Fat over hips	Little	More
Greatest curve of calf	Inside	Outside
Muscular development	Greater	Less
Body hair	More	Less
Pubic hair	Line up towards umbilicus	Line straight across lower abdomen
Excess facial hair	Present in abundance	Absent

In general, the male is larger in bone, muscle, and skeleton size above the hips, has longer limbs, less fat, and more hair on the face and body, and has the major calf-curve on the inside. The female is smaller above the waist but larger below, has shorter limbs, less body hair, and has the largest curve of the calf on the outside. Actually, the distribution of traits in each sex runs from the average for the sex out in both directions, with a wide overlapping. For example, if a distribution of indices found by dividing 100 x the chest circumference by height is made for each sex, the values of the means are 47.3 for eighteen-year-old males and 44.1 for eighteen-year-old females. The standard deviations are 2.8 and 2.5 respectively. The indices are the same at —.6 standard deviations for the males as they are at +.6 standard deviations for females. This shows a wide overlapping. There are many males who have a relatively feminine build, and many females with a somewhat masculine build, at least beyond the averages for the opposite sex. This complicates the anthropometric problem. The formulae for females, especially in the post-pubescent ages, predict a normal weight that is about 8 per cent heavier than that predicted by the male formulae for the same skeletal dimensions. Since the cause for this has not as yet been investigated experimentally in the laboratory, statements are made here upon the evidence of subjective observation and logical analysis of such observations. Such observations have been made principally on a number of female subjects whose predicted weight is much less than is accounted for by deficiencies in fat and limb girths, and on males who show the opposite phenomenon of being heavier than fat and limb girth would explain. In the case of these females, two outstanding differences from the average have been noted: (1) The chest is larger. Since the average regression weighting for chest is smaller in females than in males, this gives a somewhat smaller predicted weight. (2) The fat over the hips and thighs is markedly less, approaching the fat distribution of males. This would cause the woman to weigh less for the same skeletal measurements than would a woman of average fat distribution.

In the males the opposite is true. Males that are heavier than the measurements would seem to warrant tend to have smaller chests and a feminine fat distribution.

At present we offer no objective method of allowing for these differences, and this problem must be attacked in the future. It is suggested, however, on the basis of some empirical evidence, that in cases where the predicted weight and the subcutaneous fat and limb girths do not agree within a reasonable limit, the examiner again observe the subject closely to see if he appears to be a deviate from the normal build for sex, and if so, to compute the norms from the tables for both sexes, and interpolate to the degree that seems to be probably correct for the individual.

3. Children abnormally small or large for their age range: Occasionally one finds a child who is either exceedingly tall or very short, and whose normal weight is obviously badly missed by the normal weight formula for his age. These further fall into two categories:

(1) Individuals whose appearance does not indicate obvious glandular abnormalities and departures from the normal range of proportions: Without further study of the individual, the cause cannot be ascertained. In many situations such study cannot readily be made, as it would involve examination with the X-ray. For such cases no prediction formulae at present are available. The

most practical approximation will be obtained by using the formula for an age in which the height of the child falls within two standard deviations of the average height for the age.

To illustrate, suppose we have a twelve-year-old boy whose height is 108 cms. (an actual case). If his normal weight is predicted from the twelve-year-old formulae, the results are unreliable, as this formula was not computed from data comprising such a range. Hence we examine the averages and standard deviations for each age below twelve until we find an age in which the mean minus two standard deviations is approximately 108. (For mean heights and ± 2 standard deviations of height for each age, see Table 16.) At age 6 we find an average height of 118.7 cms. and a standard deviation of 4.67. The mean minus two standard deviations would be 109.4 cms. Hence we may use the six-year-old formula. May it be emphasized, however, that this is simply an approximation, and that the only scientifically valid method of procedure would be to

Table 16

Average Heights and the Normal Range of Heights for Each Year of Age

Age, Years	Males			Females		
	-2 S.D.	Mean	+2 S.D.	-2 S.D.	Mean	+2 S.D.
2	85.9	92.3	98.8	85.5	91.5	97.5
3	89.5	96.8	104.1	91.4	98.9	106.5
4	99.9	106.8	114.5	98.1	105.7	113.2
5	104.6	113.0	121.3	104.3	112.4	120.5
6	108.9	118.9	128.9	108.3	118.0	127.6
7	114.8	125.0	135.2	113.3	123.8	134.4
8	120.0	130.9	141.9	118.5	129.6	140.8
9	125.2	136.3	147.5	123.5	135.1	146.7
10	129.0	141.1	153.2	128.4	140.6	152.9
11	132.9	145.5	158.1	133.2	147.0	160.8
12	135.8	150.6	165.3	139.4	153.1	166.8
13	139.3	156.4	173.4	145.6	157.7	169.8
14	145.0	162.3	179.5	149.5	160.1	170.7
15	152.3	167.4	182.6	150.9	161.2	171.2
16	158.8	171.6	184.4	150.0	161.4	172.7
17	161.3	173.8	186.3	149.2	161.4	173.6
18	162.5	175.0	187.5	149.3	161.4	173.6

assess his anatomical or maturational age through studies of his bone development with the X-ray,[1] and then to use the age formula that corresponded to this maturational age. This procedure is valid, for many such children represent individuals whose physiological and anatomical age is markedly retarded or accelerated, and a child whose chronological age is twelve, for example, may have matured only to a degree corresponding to an age of seven. Physically, then, he is seven. An X-ray of the hand and wrist will enable this to be determined with relative accuracy. If in grave doubt, predictions should be made with reservations.

(2) Children presenting obvious glandular abnormalities: In such cases, the value of normal weight prediction is extremely dubious, and it is probable that the cases should be judged either by inspection alone, or simply referred to a physician if a statement of probable physical status is necessary. These cases are usually those of gigantism, anomalies of thyroid and the posterior lobe of the pituitary, and dystrophia adiposo genitalis. For such cases, no adequate standards are at present available.

4. The fourth cause of such inconsistencies is not a matter of build, but of pubescence. The average age for the onset of pubescence is roughly fourteen and one-half years in boys and thirteen and one-half years in girls. Hence the norms for fourteen-year-old boys and for thirteen-year-old girls are created from samplings that are approximately half prepubescent and half pubescent or postpubescent. The norms for a year earlier are computed from predominantly prepubescent children, and those of a year later from predominantly postpubescent children. If, however, a twelve-year-old boy is postpubescent, or a sixteen-year-old boy is prepubescent, as sometimes happens, there is apt to be a deviation from the normal. This can be compensated for by using a different age formula. If the child is of an age where it would be expected that he would be prepubescent (e.g. a boy of twelve) but he is postpubescent, it may be assumed that *physiologically* he is fourteen, and the fourteen year formula may be used. If the child is prepubescent when he is of a postpubescent age (e.g. a girl of fifteen), formulae for the last of the prepubescent years may be used. The really accurate method would be to use the formula for the age determined by an X-ray of the hands.

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[1] Standards for the X-ray appraisal may be found in references listed in Chapter X.

As soon as is practicable, different formulae and tables should be computed for prepubescent and pubescent boys of from twelve to sixteen and girls from eleven to fifteen. Until this is done, the procedure suggested above may be used.

SHORT CUTS IN THE ADMINISTRATION OF NORMAL WEIGHT PREDICTION

In many instances it will be found difficult to find the time for a busy staff to do the measuring and computing necessary to such normal weight prediction, especially to check on the changing status from month to month. An administrative short cut is suggested.

A preliminary and as yet unpublished study has shown that while build changes somewhat in some individuals from time to time, the changes are relatively slow, and the build may ordinarily be taken as relatively stable for about two years for all but the ages of pubescence. Relying upon this relative stability of build, let complete measurements be taken at the ages of 2, 4, 6, 8, 10, 12, 14, 15, 16, and 18. (Changes in build may occur with greater frequency from twelve to sixteen than before the age of twelve or after sixteen.) At the time of the complete measurements, compute from the tables the normal weight and also the per cent this normal weight is of the average weight for sex, age, and height. (See Chapter II.) Following this, for the interval until the next complete measuring, use the age-height-weight table value for weight multiplied by this per cent. To illustrate: let us use the case of an eight-year-old girl whose height was 124 cms. and whose percentage index of build was 104. Let us follow her further. When we measure her height and weigh her three months later, she is now 127 cms. tall. The age-height-weight table average for this height at eight years of age would be 25.3 kilograms, and 104 per cent of this would be 26.3 kilograms, which may be taken as her norm at that time (clothed). The next year her height is 131 cms. From the age-height-weight tables at nine her average would be 27.3; 104 per cent of this would be 28.4, which should be approximately her normal weight. If the intervals between complete measurements are not allowed to become too long, this short cut method will be found fairly satisfactory.

The question of the comparative importance of weight norms in the prediction of physical and nutritional status will be discussed below in Chapter IX.

CHAPTER V

THE MEASUREMENT OF SKIN AND SUBCUTANEOUS FAT

In *Appraising Physical Status: The Selection of Measurements* (40) it was reported that in the studies conducted on the problem of how best to measure the amount of fat on the body it was found that the total amount of subcutaneous fat (as distinguished from the internal fat) could be measured with a very high degree of accuracy by taking five measurements. Two others were recommended for situations in which it is not feasible to remove the clothing above the waist. These measurements are taken with an especially designed fat caliper.[1] The technique of measurement is given in detail in Chapter IX of the previously mentioned study.

The measurements to be taken are as follows:

1. Chest Front: On the front of the chest on the left side at the level of the xiphoid cartilage and halfway between the mid-line and the sagittal plane tangent to the side of the chest.

2. Chest Back: On the back on the left side at the level of the xiphoid cartilage and over the greatest bulge of the erector spinae muscles.

These two measurements are also used in the correction of the chest girth. In taking them the blades of the caliper are vertical.

3. Abdomen: On the abdomen approximately halfway between the left nipple (or the corresponding place in the female) and the umbilicus, just over the edge of the costal cartilage. The caliper blades are parallel to the line between the two landmarks.[2]

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[1] These may be purchased from Mr. A. V. O'Brien, 904 Bowery St., Iowa City, Iowa.

[2] In some cases it has been found that the measurement we have called "chest front" is exceedingly difficult to measure because of the adherence of the skin to the underlying fascia. This happens in only 2 or 3 per cent of the cases, but since the chest front measurement is necessary for the correction of the chest girth, ways of adapting to this difficulty are necessary. It has been found that the correlation between the abdomen measurement and the chest front measurement averages about .90. Hence, in cases where it is difficult to measure the chest front, the abdomen measurement may be converted into the chest front measurement by the following formula:

Males $\text{Chest Front} = .73\ \text{Abdomen} + 3.0$
Females $\text{Chest Front} = .63\ \text{Abdomen} + 3.6$

A table for computing this is found on page 35.

4. Supra-iliac: On the left side just above the ilium and in the axillary line. The blades of the caliper are vertical. This measurement is also used to correct the bi-iliac hip width.

5. Hip Difference: This is the maximum width of the hips measured at the level of the trochanters without pressure minus the bi-cristal width of the hips (corrected for fat).

6. Arm Front: Taken over the biceps midway between the acromion and the elbow. The arm is straight and the blades of the caliper are parallel to the long axis of the arm.

7. Arm Back: Taken over the triceps midway between the acromion and the elbow, slightly to the axillary side of the mid-line of the triceps muscle. The caliper blades are parallel to the long axis of the arm.

Arm front and arm back are supplementary measurements which need not be taken if the body fat measurements are available as they add nothing of importance to the prediction made from the body measurements.

The measurement of the skin and subcutaneous fat offers few difficulties in the case of children. Occasionally a corpulent child has a skin so tight and hard to "pick up" as to make it difficult to measure the chest front fold of skin accurately. In such cases, the best one can do is to pick it up as well as possible, and in some cases, as stated above, to substitute the regression value from the abdomen measurement instead. In the case of adults, two difficulties are sometimes found. The first is the same as that just mentioned—a too-tight skin. This is usually in the case of those who are rapidly becoming fatter. Here one does the best he can, with the realization that in case he makes somewhat of an error, it is still apparent that, at least in so far as fat is concerned, the individual is not malnourished. The second difficulty is harder to meet. In the case of middle-aged persons who have been fatter than they are at the time of measuring, one frequently finds a loose, baggy skin that covers a mass of very soft, movable fat. If one takes the same measurement several times in succession, it is smaller at each succeeding trial—the fat is simply squeezed out from under the place measured. In such cases, perhaps the best thing one can do is to pick up the skin and fold of fat carefully, avoid too much finger pressure, adjust the calipers without allowing too much pressure from the spring, and make as careful an estimate of the thickness of the fat layer as possible. This will not be objectively accurate, but will be more accurate than it would be with an unchecked spring pressure on such loose skins. Fortunately, as we have stated, such conditions are practically never met in children of school ages.

Using young adult subjects, the multiple correlation of the first five measurements with the total fat (sum of fourteen measurements taken on all parts of the body (40, p. 74)) was .9312 for males and .9623 for females. It was .9253 and .9586 for males and females respectively when only the first four measurements were used. It would seem, therefore, that the hip difference in most cases is not worth the added work of computation. In postpubescent females it will be found useful in many individual cases and may well be added to the battery, but should be interpreted separately. It probably is of very limited usefulness for males of all ages.

The multiple correlation of the two arm fat measurements with total fat was .88 for both male and female adults. Adding the two arm measurements to the body measurements adds nothing of significance to the multiple correlation, and they are not worth the time taken to measure them if the others are available.

The next step in the study was to compare the multiple correlation with the criterion of the ''best'' weights for the four fat measurements and of the unweighted sum of the fat measurements. Since the relative weightings found in most cases did not differ greatly from unity, it was expected that the correlations would not be far apart. This was found to be true. In almost all combinations tried, the difference between the two correlations was only in the third decimal. Hence it did not seem necessary to weight the fat measurements.

It is recommended, therefore, that the four fat measurements of chest front, chest back, abdomen, and supra-iliac be summed without weighting. In the case of post-pubescent females who seem, upon subjective inspection, to be fat over the hips, it will be well also to measure the hip difference, but to consider the measurement separately from the others. The arm measurements need be taken only when it is impossible to measure the fat of the torso.

STANDARDS

As was stated in Chapter V of *Appraising Physical Status: The Selection of Measurements*, two criteria for norms of fat are proposed. The first of these is simply the average of all of that sex and age regardless of build. It is believed by the author that this is the best criterion to adopt, as well as the simplest, and it is proposed here for use.

Since the measurements as recorded on the fat calipers are from an arbitrary origin (6 mm.), and since the measurement also includes the skin, percentage standards mean little. We have, therefore, found the minimum measurement recorded for the sum of the fat measurements at each age. These minima have been smoothed by ages, and will be found in Table 140 of the Appendix. The percentage is then given in terms of the departure from the mean in units of mean—minimum. For instance, let us use as examples two girls eighteen years old:

Measurement	Actual Measurement	Norm	Minimum	Range	Per Cent
		First Girl			
Chest Front	17	20	11	9	—33
Chest Back	19	25	12	13	—46
Abdomen	18	25	13	12	—58
Supra-iliac	22	28	15	13	—46
Total	76	98		47	
Average					—46
		Second Girl			
Chest Front	22	20	11	9	+ 22
Chest Back	28	25	12	13	+ 23
Abdomen	30	25	13	12	+ 42
Supra-iliac	31	28	15	13	+ 23
Total	111	98		47	
Average					+ 27.5

Approximately the same information can be secured in less time by dealing in sums only. For example, it will be seen that the sum of the four measurements is 76 for the first girl, and 111 for the second. The sum of the four normal measurements is 98, and the sum of the differences from normal to minimum is 47. The percentage of over or under fat may be determined by the following formula:

$$\text{Percentage over or under fat} = \frac{100\ (\text{Actual measurements}) - (\text{Normal})}{(\text{Differences between normal and minimum})}$$

In the case of the girls discussed above, this would be

$$(1)\quad \frac{100\ (76 - 98)}{47} = -46.8 \text{ per cent}$$

$$(2)\quad \frac{100\ (111 - 98)}{47} = 27.6 \text{ per cent}$$

This is the percentage of fat alone, not of total body bulk.

If the deviation from the mean divided by the difference between the mean and the minimum is used as the standard, the zone of normality recommended is from —33 per cent to +66 per cent. There is considerable difference in the various age groups, but these values seem to be reasonably consistent. They will represent about the first and third quartiles respectively.

If it is desired to divide the actual total fat by the mean total fat, the zone of normality may be taken as from 90 per cent to 120 per cent. These values, also, represent an average approximation of the first and third quartiles.

Since some experimenters may prefer to take body build into consideration in the prediction of fat, the regression values for fat from the measurements of height, chest circumference (corrected

Table 17

Equations for the Prediction of Total Normal Trunk Fat[#] from Body Build Measurements

Age, Years	Equation
	Males
4	Trunk Fat = -.0347 Height -.0255 Chest Cir.* -.0608 Hips +.5554 Knee +7.62
5	Trunk Fat = -.0637 Height -.0806 Chest Cir. +.1840 Hips +.9205 Knee +6.77
6	Trunk Fat = -.0333 Height +.0524 Chest Cir. +.1740 Hips +.0426 Knee +2.61
7	Trunk Fat = -.0697 Height +.0449 Chest Cir. +.0616 Hips +.6872 Knee +4.76
8	Trunk Fat = -.0453 Height +.0456 Chest Cir. +.1725 Hips +.5171 Knee +1.17
9	Trunk Fat = -.0450 Height +.1066 Chest Cir. +.1141 Hips +.2235 Knee + .65
10	Trunk Fat = .0008 Height +.0552 Chest Cir. +.0171 Hips +.4713 Knee -2.34
11	Trunk Fat = -.0289 Height +.0048 Chest Cir. +.0503 Hips +.5787 Knee +3.50
12	Trunk Fat = -.0194 Height -.0163 Chest Cir. -.0088 Hips +.8054 Knee +2.88
13	Trunk Fat = -.0177 Height +.0536 Chest Cir. -.1099 Hips +.9111 Knee - .73
14	Trunk Fat = -.0479 Height +.0193 Chest Cir. +.1279 Hips +.6452 Knee +3.01
15	Trunk Fat = -.0588 Height +.0820 Chest Cir. +.0868 Hips +.4167 Knee +3.26
16	Trunk Fat = -.0272 Height -.0025 Chest Cir. +.0510 Hips +.6436 Knee +3.43
17	Trunk Fat = -.0002 Height +.0110 Chest Cir. +.0502 Hips +.4075 Knee + .09
College Men	Trunk Fat = -.0469 Height +.0463 Chest Cir. +.0276 Hips +.3932 Knee +6.54
	Females
4	Trunk Fat = -.0399 Height +.0177 Chest Cir.* +.1019 Hips +.6402 Knee +2.99
5	Trunk Fat = -.0242 Height -.0420 Chest Cir. +.1764 Hips +.6042 Knee +3.30
6	Trunk Fat = -.0225 Height +.0024 Chest Cir. +.1297 Hips +.7187 Knee + .68
7	Trunk Fat = .0401 Height +.0188 Chest Cir. +.1669 Hips -.2374 Knee -1.64
8	Trunk Fat = -.0238 Height +.0742 Chest Cir. +.1783 Hips +.4201 Knee -1.88
9	Trunk Fat = -.0564 Height +.1215 Chest Cir. +.2159 Hips +.5163 Knee -1.85
10	Trunk Fat = -.0701 Height +.0818 Chest Cir. +.3067 Hips +.2375 Knee +2.76
11	Trunk Fat = -.0834 Height +.0489 Chest Cir. +.2254 Hips +.5537 Knee +5.94
12	Trunk Fat = -.0568 Height +.0100 Chest Cir. +.2689 Hips +.7568 Knee +2.02
13	Trunk Fat = -.0505 Height +.0403 Chest Cir. +.2139 Hips +.6299 Knee +1.58
14	Trunk Fat = -.0542 Height +.0681 Chest Cir. +.0959 Hips +.6592 Knee +3.13
15	Trunk Fat = .0055 Height +.0654 Chest Cir. -.0322 Hips +.9080 Knee -4.88
16	Trunk Fat = -.0315 Height +.0686 Chest Cir. +.0860 Hips +.4891 Knee +1.39
17	Trunk Fat = -.0429 Height +.0243 Chest Cir. +.0680 Hips +.4880 Knee +7.23
College Women	Trunk Fat = -.0160 Height -.0172 Chest Cir. +.1217 Hips +.3490 Knee +6.71

[#] Trunk fat = chest front + chest back + abdomen + supra-iliac

*Chest circumference corrected for fat.

for fat), hip width (corrected for fat), and knee width were computed. These will be found in Table 17, p. 52. Since these are not recommended for general use, tables for easy computation have not been worked out.

On page 49 was mentioned the measurement called "hip difference," which was the width of the hips over the trochanters, taken without pressure (just touching the skin with the calipers), minus the width of the hips at the crests of the ilia (with pressure), corrected for fat. This measurement is not recommended for general use, and is suggested for use only with some postpubescent females, never with prepubescent females or with males of any age. In some few cases, however, the fat pads on the two sides of the hips and thighs (See *Appraising Physical Status: The Selection of Measurements* (40), p. 70) grow to a very large size in these postpubescent females, causing the individual to become much more overweight than general inspection or the amount of the total torso fat would seem to justify. In such cases, this measurement may be used. The norms for the significant ages, together with the minima are found in Table 140 (Appendix).

Chapter VI

THE MEASUREMENT OF LIMB GIRTHS: STANDARDS AND NORMS

In Chapter V of *Appraising Physical Status: The Selection of Measurements* (40) it was shown that while the measurements of the circumference of the limbs are not apparently highly correlated with muscular strength, such measurements are highly correlated with the physical and nutritional status. Studies by Faust (20) and Cox (14), however, would indicate that the relatively low relationships between limb girth and total strength found in other studies are probably due more to defective techniques and low reliabilities in testing strength than to lack of relationship of strength with the size of the limb. Further evidence bearing on this problem is given by a study of grip strength as related to forearm circumference. This study was made on two groups, fifteen-year-old boys and eleven-year-old girls, and the correlation between grip strength of left hand and circumference of left arm was found to be .634 for the boys but only .289 for the girls. (Before considering these results, attention should be called to the fact that the muscles involved in grip strength constitute less than half of the muscular cross section of the forearm. The other muscles are concerned with the extension of the hand and fingers and with the movements of the wrist and forearm. It is probable that these other muscles correlate quite highly with the muscles used in gripping, but this correlation may be far from perfect.) This study, as far as the boys are concerned, partially confirms the studies by Faust and Cox. The girls, however, show either an inability to exert a maximum effort in a strength test, or a wide difference in the proportion of muscular tissue to other tissue in the forearm as was found in the studies cited in Chapter VI of *Appraising Physical Status: The Selection of Measurements.*

It was further shown in the previous publication that the best and most practical variables for the prediction of normal upper arm and forearm girths were chest girth, uncorrected for fat, and elbow width, and for thigh and calf circumference, chest girth and knee width. Because of occasionally overdeveloped fat pads in the postpubescent female, overdevelopment of the thigh at those ages is of little significance in this sex. Underdevelopment, however, is of just as much significance as in other ages and in males. Those individuals whose thigh girths are greatly affected by the thigh and hip fat comprise but a few in a hundred and those few can be readily recognized. The same is true, though to a lesser extent, of upper arm girths in the obese.

INTERPRETATION OF MEASUREMENTS

In interpreting the significance of developments in limb girths from the norms, the standard deviations of the per cents of over or under the normal will be of assistance. Several samples have been computed for both males and females. The standard deviations of the different groups vary little from group to group. The average standard deviations of the percentage deviations for each sex are as follows:

Measurment	Males	Females
Upper arm	5.2	4.8
Forearm	3.7	3.4
Thigh	4.1	4.1
Calf	4.6	4.4
Average of all four per cents	3.0	3.1

If we adopt the quartile below the mean as the normal limit of variability, this would be approximately two-thirds of a standard deviation, and would equal about 2 per cent for the average of all limb girths and about 3 per cent for the individual limb girths.

It may be thought that this is much less than the normal weight variation, but since the circumference deviation of the limb corresponds to the square root of the cross-section deviation of the muscles, a deviation of 2 per cent in girth corresponds to a change of about 4 per cent in cross section—approximately the same as the quartile deviation of under- and overweight.

We have suggested only a lower limit for the limb girth standards, as it is felt that there is little danger of overdevelopment of limb muscles. Hence, an upper limit is not needed, as would be the case with weight and fat. It is therefore suggested that —2 per cent be considered as the *normal* lower limit of average limb girth variability, and —3 per cent (one standard deviation) as the limit below which attention should surely be given. This becomes 3 per cent and 4 1/2 per cent for the individual girths.

REGRESSION FORMULAE FOR PREDICTING LIMB GIRTHS

Formulae have been computed for predicting limb girths for ages from four to eighteen, using in each case chest girth and width of elbow for predicting normal girths of upper arm and of forearm, and chest girth and width of knee for predicting normal girths of thigh and calf.

As was shown in Chapter VI of *Appraising Physical Status: The Selection of Measurements* these variables were usually the "best" for such prediction. Where there were others whose correlations were higher, the differences were very slight, and since the differences in the multiple correlations were negligible (usually not more than .01), it seems advisable to use the same measurements throughout rather than to change from age to age, and thus avoid the administrative confusion that would accompany changing variables from age to age. These formulae are given in the following tabulation, together with the multiple correlation with the actual girths. (Chest cir. = chest circumference). Tables for the rapid computation of these standards are given in Appendix (Tables 82 to 139).

Age, Years	Equation				Multiple Correlation
			Males		
4	Upper arm	= .2907 Chest Cir.*	+1.8782 Elbow	+ 2.75	.6122
	Forearm	= .0988 Chest Cir.	+1.8745 Elbow	+ 2.58	.7783
	Thigh	= .3423 Chest Cir.	+2.1437 Knee	− 1.61	.7009
	Calf	= .1486 Chest Cir.	+1.8036 Knee	+ .97	.6346
5	Upper arm	= .2056 Chest Cir.	+2.2433 Elbow	− 5.35	.6959
	Forearm	= .1444 Chest Cir.	+1.9487 Elbow	− .24	.7702
	Thigh	= .3715 Chest Cir.	+3.3645 Knee	−12.19	.7706
	Calf	= .2611 Chest Cir.	+1.4904 Knee	− 2.60	.7572
6	Upper arm	= .3890 Chest Cir.	+1.3297 Elbow	−11.22	.7612
	Forearm	= .2582 Chest Cir.	+1.4657 Elbow	− 4.32	.8338
	Thigh	= .7062 Chest Cir.	+1.8968 Knee	−19.82	.7754
	Calf	= .4023 Chest Cir.	+1.3576 Knee	− 9.34	.8129
7	Upper arm	= .2959 Chest Cir.	+1.7270 Elbow	− 8.37	.7408
	Forearm	= .2018 Chest Cir.	+1.4395 Elbow	− 1.06	.8263
	Thigh	= .5804 Chest Cir.	+2.1808 Knee	−14.91	.7627
	Calf	= .2625 Chest Cir.	+1.6951 Knee	− 3.72	.7382
8	Upper arm	= .3500 Chest Cir.	+1.5283 Elbow	−10.91	.7802
	Forearm	= .2335 Chest Cir.	+1.4945 Elbow	− 3.30	.8619
	Thigh	= .7926 Chest Cir.	+1.7416 Knee	−24.17	.7569
	Calf	= .4163 Chest Cir.	+1.0000 Knee	− 7.37	.7689

Age, Years			Equation				Multiple Correlation
			Males				
9	Upper arm	= .2907	Chest Cir.*	+1.6802	Elbow	− 8.10	.7965
	Forearm	= .1671	Chest Cir.	+1.5035	Elbow	+ .71	.7881
	Thigh	= .6520	Chest Cir.	+1.9696	Knee	−17.17	.8019
	Calf	= .2525	Chest Cir.	+1.3821	Knee	− .13	.7169
10	Upper arm	= .3315	Chest Cir.	+1.6123	Elbow	−10.37	.8111
	Forearm	= .2274	Chest Cir.	+1.4654	Elbow	− 2.78	.8329
	Thigh	= .7564	Chest Cir.	+1.4088	Knee	−19.08	.8497
	Calf	= .3438	Chest Cir.	+1.5640	Knee	− 7.46	.8418
11	Upper arm	= .2598	Chest Cir.	+1.5865	Elbow	− 5.73	.7237
	Forearm	= .1865	Chest Cir.	+1.7485	Elbow	− 1.79	.7985
	Thigh	= .5415	Chest Cir.	+2.3734	Knee	−13.75	.7849
	Calf	= .2757	Chest Cir.	+1.8741	Knee	− 5.94	.7686
12	Upper arm	= .2572	Chest Cir.	+1.4467	Elbow	− 5.32	.8218
	Forearm	= .1971	Chest Cir.	+1.2559	Elbow	+ .22	.8357
	Thigh	= .4613	Chest Cir.	+2.1099	Knee	− 6.60	.8269
	Calf	= .2351	Chest Cir.	+2.0266	Knee	− 4.67	.8353
13	Upper arm	= .2872	Chest Cir.	+1.1496	Elbow	− 5.74	.8584
	Forearm	= .2382	Chest Cir.	+ .7317	Elbow	+ .56	.9001
	Thigh	= .4891	Chest Cir.	+2.4994	Knee	−12.29	.8916
	Calf	= .2830	Chest Cir.	+1.5980	Knee	− 3.84	.8776
14	Upper arm	= .3168	Chest Cir.	+ .6584	Elbow	− 5.03	.8346
	Forearm	= .2077	Chest Cir.	+1.4847	Elbow	− 1.82	.8821
	Thigh	= .4838	Chest Cir.	+2.0442	Knee	− 7.69	.8471
	Calf	= .2836	Chest Cir.	+1.7544	Knee	− 5.23	.8598
15	Upper arm	= .2962	Chest Cir.	+1.0698	Elbow	− 6.19	.8476
	Forearm	= .1761	Chest Cir.	+1.7587	Elbow	− 1.08	.8853
	Thigh	= .4659	Chest Cir.	+2.5999	Knee	−11.92	.8534
	Calf	= .1657	Chest Cir.	+2.3674	Knee	− 1.98	.8349
16	Upper arm	= .2660	Chest Cir.	+1.1152	Elbow	− 4.24	.7637
	Forearm	= .1843	Chest Cir.	+1.8716	Elbow	− 2.34	.8226
	Thigh	= .4774	Chest Cir.	+2.1905	Knee	− 9.24	.8063
	Calf	= .1951	Chest Cir.	+1.7872	Knee	+ 1.36	.7469
17	Upper arm	= .2424	Chest Cir.	+1.7731	Elbow	− 6.24	.8305
	Forearm	= .1631	Chest Cir.	+1.8009	Elbow	− .14	.8430
	Thigh	= .4062	Chest Cir.	+2.7402	Knee	− 8.09	.8686
	Calf	= .1379	Chest Cir.	+2.3222	Knee	+ 1.40	.7265
College Men	Upper arm	= .2987	Chest Cir.	+ .4090	Elbow	− 1.71	.7527
	Forearm	= .1723	Chest Cir.	+ .7433	Elbow	+ 5.39	.7290
	Thigh	= .5646	Chest Cir.	+1.1231	Knee	− 5.59	.7548
	Calf	= .2355	Chest Cir.	+ .7563	Knee	+ 8.18	.6113

Age, Years	Equation	Multiple Correlation
	Females	
4	Upper arm = .2664 Chest Cir.* + .7509 Elbow − .74	.7557
	Forearm = .2594 Chest Cir. +1.0700 Elbow − 1.80	.8559
	Thigh = .6525 Chest Cir. +1.2937 Knee − 9.86	.8374
	Calf = .4164 Chest Cir. + .6980 Knee − 4.30	.7282
5	Upper arm = .2747 Chest Cir. +1.5644 Elbow − 4.94	.8122
	Forearm = .1786 Chest Cir. +1.3974 Elbow + .82	.8204
	Thigh = .6042 Chest Cir. +1.5007 Knee − 8.73	.8154
	Calf = .3320 Chest Cir. +1.2526 Knee − 8.54	.8330
6	Upper arm = .2498 Chest Cir. +1.5115 Elbow − 3.64	.7782
	Forearm = .1739 Chest Cir. +1.3956 Elbow + .91	.8313
	Thigh = .6064 Chest Cir. + .8933 Knee − 4.31	.7762
	Calf = .3176 Chest Cir. +1.1673 Knee − 2.02	.8608
7	Upper arm = .3768 Chest Cir. +1.0637 Elbow − 8.65	.8412
	Forearm = .1906 Chest Cir. +1.5256 Elbow − .67	.8435
	Thigh = .6360 Chest Cir. +1.9387 Knee −13.36	.8081
	Calf = .3912 Chest Cir. +1.2591 Knee − 6.87	.8558
8	Upper arm = .2604 Chest Cir. +1.8338 Elbow − 5.83	.8045
	Forearm = .1397 Chest Cir. +2.0212 Elbow − .28	.8558
	Thigh = .6425 Chest Cir. +2.1831 Knee −15.48	.8610
	Calf = .3220 Chest Cir. +1.2772 Knee − 2.86	.8264
9	Upper arm = .4517 Chest Cir. + .7654 Elbow −11.97	.8452
	Forearm = .2314 Chest Cir. +1.1510 Elbow − 1.42	.8341
	Thigh = .7113 Chest Cir. +1.8910 Knee −17.84	.8274
	Calf = .4087 Chest Cir. +1.1133 Knee − 6.78	.7199
10	Upper arm = .4207 Chest Cir. + .4133 Elbow − 8.11	.7735
	Forearm = .2421 Chest Cir. +1.1107 Elbow − 1.82	.8219
	Thigh = .6078 Chest Cir. +2.0237 Knee −11.98	.7958
	Calf = .3149 Chest Cir. +1.5442 Knee − 4.49	.7834
11	Upper arm = .2656 Chest Cir. + .8814 Elbow − 1.20	.7145
	Forearm = .1319 Chest Cir. +1.7325 Elbow + 1.72	.8190
	Thigh = .5198 Chest Cir. +2.1606 Knee − 7.64	.8303
	Calf = .2240 Chest Cir. +1.7214 Knee − .09	.8147
12	Upper arm = .2884 Chest Cir. +1.2214 Elbow − 4.56	.7698
	Forearm = .1673 Chest Cir. +1.4017 Elbow + 1.44	.8453
	Thigh = .5254 Chest Cir. +2.4632 Knee − 9.87	.8304
	Calf = .2354 Chest Cir. +1.8946 Knee − 2.07	.8228
13	Upper arm = .2317 Chest Cir. +2.2451 Elbow − 6.70	.7924
	Forearm = .0997 Chest Cir. +2.0501 Elbow + 2.34	.8294
	Thigh = .3357 Chest Cir. +3.7625 Knee − 7.97	.7801
	Calf = .1687 Chest Cir. +2.2830 Knee − .73	.7986

Age, Years		Equation						Multiple Correlation
				Females				
14	Upper arm	= .2396	Chest Cir.*	+2.3388	Elbow	−	7.59	.8331
	Forearm	= .0997	Chest Cir.	+2.1718	Elbow	+	1.92	.8008
	Thigh	= .4007	Chest Cir.	+3.2402	Knee	−	6.84	.8186
	Calf	= .1887	Chest Cir.	+1.3757	Knee	+	6.31	.7347
15	Upper arm	= .2241	Chest Cir.	+1.6513	Elbow	−	1.99	.7137
	Forearm	= .1010	Chest Cir.	+1.9357	Elbow	+	3.50	.6915
	Thigh	= .3167	Chest Cir.	+3.7123	Knee	−	4.64	.7664
	Calf	= .1315	Chest Cir.	+2.1371	Knee	+	3.85	.7296
16	Upper arm	= .2112	Chest Cir.	+1.4861	Elbow	−	.20	.6534
	Forearm	= .0895	Chest Cir.	+1.9128	Elbow	+	4.29	.6869
	Thigh	= .4012	Chest Cir.	+3.6608	Knee	−	10.27	.7839
	Calf	= .1520	Chest Cir.	+1.8660	Knee	+	4.90	.7429
17	Upper arm	= .1794	Chest Cir.	+ .7021	Elbow	+	7.15	.5447
	Forearm	= .0676	Chest Cir.	+1.6334	Elbow	+	7.90	.4661
	Thigh	= .3538	Chest Cir.	+3.0251	Knee	+	.17	.7302
	Calf	= .1337	Chest Cir.	+1.4852	Knee	+	9.69	.6317
College Women	Upper arm	= .2582	Chest Cir.	+1.1653	Elbow	−	2.68	.7686
	Forearm	= .1400	Chest Cir.	+1.2671	Elbow	+	4.45	.7834
	Thigh	= .4847	Chest Cir.	+2.6672	Knee	−	6.15	.7892
	Calf	= .1523	Chest Cir.	+1.7080	Knee	+	6.25	.6961

* *Not* corrected for fat.

CHAPTER VII

TESTS OF STRENGTH AS MEASUREMENTS OF PHYSICAL STATUS

Anthropometric measurements alone cannot distinguish clearly between structure and function. Two individuals may be of approximately the same external size and proportions, one being somewhat fatter than the other but less well developed muscularly, while the other has a much better muscular development but less overlying fat. This latter individual will in general function better, will be less fatigued by the day's work, and will have, other things being equal, a better development of heart and other internal organs (39). The anthropometric methods of measuring structure are not apt at distinguishing between such individuals, and other methods must be used. Among the measures suggested, tests of strength seem to meet the need better than any other type of tests.

Since muscle tissues constitute approximately 40 per cent of the body weight of the normally developed person, the functioning of this muscular tissue is of major importance for the health and effective use of the total organism. The evidence for such a statement is partly philosophical and partly experimental.

The philosophical evidence is well summed by Tyler (64). In the first place, the organic evolution of the body was an accompaniment of the increasing demands of an improving muscular system. When, for example, the form of animal life advanced from that of the worm (who had what corresponds to our trunk and neck muscles only) to that of the fishes, the increased demand for fuel and oxygen and for a means of eliminating wastes resulted in the organism developing much improved systems of organs of digestion and assimilation, of respiration, of elimination, and of circulation. The same thing is seen in the further advances of the muscular system through the higher stages. When this situation was further complicated with the development of the special senses, the increased motor possibilities resulted in the further development of the brain and other parts of the central nervous system. With the development of the hand in the ape-like prehuman antecedents, the higher powers of the brain progressed much further.

It is held by numerous biological students of the evolution of man that the various visceral systems retain their phylogenetic relation to the demands of the muscular system, and, as a result, the normal maturation of those systems in the growing child is largely dependent upon the stimulus to growth and development of the muscular system through appropriate exercise and activity.

This relationship is easiest seen in the case of the heart. This organ, which is in itself a muscular organ, is dependent for its development upon the stimulus to further activity that is received from the active exercise of the other parts of the skeletal muscular system. Those leading sedentary lives have relatively flabby hearts, while those that lead muscularly active lives have hearts that are developed proportionately, hearts that are attuned to emergency demands as well as to normal day-by-day activities. The argument with regard to the other viscera is elaborated by Tyler and will not be pursued further here.

The experimental evidence is as yet scanty, but consistent in so far as it is available. In 1931, Chamberlain and Smiley (12) at Cornell University co-operated in the study of a group of male college students. Medically they divided these students into three groups as "superior," "average," and "handicapped," and then tested them for strength. The strength was interpreted in terms of a physical fitness index, which is 100 times the actual strength divided by the normal strength for the individual, in which deviations from 100 represent percentage deviations from the norm for the age, sex, and weight of the individual. The triserial correlation with the medical findings (present author's computations) was .64.

In 1935, Hernlund (26) published a study in which a number of Young Men's Christian Association secretaries were examined medically and also tested for strength. In this case, the medical examination was scored in semiobjective units which to a certain degree lessened the subjectivity of the usual medical examination. The correlations with the strength tests, again given in the form of a physical fitness index, differed somewhat with the ages of the subjects. The results are given below.

Age, Years	Subjects	Correlation
18 to 29	44	.529
30 to 39	43	.372
40 to 53	22	.811

It is obvious upon examination of the scattergrams of these correlations that the chance variations of small samples played quite a part in the size of the correlations. The combination of sedentary secretaries with muscularly active physical directors also lowered the correlations. To reduce the effects of the small number of cases, the correlation of the whole group was computed, with the medical scores and indices as of deviations from the means of their respective age groups rather than from the means of all groups combined. The correlation coefficient obtained was .592.

It is suggestive that the oldest group shows the highest correlation between strength and medical ratings. The "true" correlations between health scores and the physical fitness index are probably slightly higher than those given, for, while the reliabilities of strength tests for men run about .96 on the average (52, 13, 23), the reliability of medical appraisements is much lower. Franzen (23) found the correlations between two physicians ran from as low as .18 to as high as .82, with an average of .60. If we assume a reliability of as high as .70 for the medical score and .96 for the strength tests, and a correlation of .6 between the medical score and the physical fitness index, that correlation, corrected for attenuation, would be raised to .74.

Similar data are lacking for girls and women. Hence, precise information is not available as to the correlation between the physical fitness index and physical condition. In one study the correlation between the physical fitness index and a subjective rating of the girl's feelings[1] was computed. It must be realized that glandular diatheses, environmental stimuli, and many other elements would affect such ratings. This correlation was .31. Since the reliability of the strength measurements was only .77, it is improbable that the "true" correlation was much higher than .40. If these ratings were supplemented by medical examinations, as in the case of the Hernlund (26) and the Chamberlain and Smiley (12) studies, it is probable that the correlations would not differ markedly from those of the men. Similar studies have not as yet been done on children.

From the standpoint of efficient functioning of the organism, muscle strength is of greater importance than these correlations cited would indicate. Each individual is required to carry or support his bodily weight from morning to night. He must do this with the musculature he has. It is known that a muscle that is too weak for its task works at a lower efficiency than does one that is adequately developed (28). Hence, an individual who is markedly underdeveloped is working inefficiently, so far as his muscles are concerned, and is suffering greater fatigue, both locally and generally. He has less energy with which to approach his tasks, suffers more from fatigue toxemia, and works under a greater nervous strain. Hence, in addition to its indications as to general "medical" condition, the strength tests in the form of the physical fitness index tell much about the individual's *general* fitness for living and working.

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[1] In Anderson's study (2) the girls rated themselves as to how they felt most of the time, using for the purpose a prepared semiobjective rating scale. Only the records of girls whose own judgments agreed closely with those of the instructor were used in the study.

TESTS AND NORMS

The most used test of strength is the simple one of strength of the grip of the right and left hands. This correlates about .70 with the strength of the whole body. While this correlation is not high, grip strength is frequently used because it is convenient to administer. The only apparatus needed is a grip dynamometer.

When more time, equipment, and ambition are available, the more extensive test is advised. The Rogers test or the author's modification of it is suggested for this purpose. These two tests are very similar. In the Rogers test, records of the breathing capacity, strength of the right and left grips, back strength, and leg strength are added to a derived arm strength measure obtained from "chinning" or the pull-up on a bar or rings, and from "dipping," or the push-up on the parallel bars for boys, or on a bench for girls. The directions for this test and the standards are given in Frederick Rand Rogers (51).

PHYSICAL CAPACITY TEST

In the author's test, norms for which are given in the Appendix (Tables 142 and 148), certain modifications have been made, but the tests are essentially the same as those used in the Rogers test. Breathing capacity has been omitted as not belonging in a battery of strength tests, and the pull-ups and push-ups are scored in a different manner (Tables 141, 146, 147).

Equipment

1. A grip dynamometer: Two types of grip dynamometer are available. The one usually used is the spiral spring type.[1] This is

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[1] This may be purchased from the Narragansett Machine Co., Providence, Rhode Island.

accurate, but not adjustable to size of hand. For ages of ten or over (the only ages for which there are adequate norms at present), this is not of great importance, and may be an advantage because of the fact that the adjustable hand dynamometers are frequently not adjusted properly. The other type is the Smedley grip dynamometer.[1] This is more expensive, but can be adjusted to the size of hand of the individual. No norms are as yet available as to how best to adjust it. The method used at the Iowa Child Welfare Research Station is an arbitrary one, based upon a brief experiment with a very small number of cases. This dynamometer has within its handle a bar which can be screwed up or down to fit the grip. At this Station the practice is to rest the lower bar horizontally across the palm of the hand with the thumb held perpendicular to the palm itself. The bar is placed against the thumb. The top bar is then adjusted so that the top of it is opposite the opening between the index and middle fingers.

2. Back and leg dynamometer: This instrument may be purchased from the Narragansett Machine Company, Providence, Rhode Island, from the Medart Company, St. Louis, Missouri, or the George Tiemann Company, 107 East 28th Street, New York City. The instrument is expensive, costing from $80 to $100. It is important that these instruments be checked for accuracy when purchased. This may be done by hanging the instrument from its base and suspending known weights from the handle end.

3. A bar for measuring chinning or pull-up: If the tests are to be given to both boys and girls, an adjustable bar is much to be preferred to the bar having only one height. Rogers proposes that a small pair of rings be hung on the bar for chinning. The author has experimented and finds that there is practically no difference in the number of times an individual can pull him or herself up whether using rings or grasping the bar directly with the undergrip (palms toward the face). The rings are convenient, but are an unnecessary luxury.

4. Parallel bars: Either parallel bars or "dipping bars" which are hung on the wall are necessary for the dip or push-up for boys. Adjustable parallel bars are much to be preferred, since the width may be adjusted to the size of the subject.

5. A stall bar bench or stool: A standard stall bar bench or a

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[1] This may be purchased from the C. H. Stoelting Co., 424 N. Homan Ave., Chicago, Ill.

stool 15 inches high by 20 inches long and 12 inches wide is needed for dipping for girls.

Methods of Testing Strength

1. Grips: For grip strength a towel should be provided upon which to dry the hands. In warm weather a cake of magnesium carbonate should also be provided for the purpose of making the hands less slippery.

One edge of the grip dynamometer is curved upward at the ends. This edge should be placed against the fingers and the more rounded edge against the base of the hand. The indicator should be towards the palm, as the fingers are apt to interfere with the movement of the indicator if it is placed away from the palm.

The outer edge of the dynamometer is placed between the first and second joints of the fingers. The subject may assume any position he wishes with arm or body, so long as the hand or fingers are not permitted to rest against the body or any other object. The record should be read at the nearest pound as shown on the dial.

2. Back lift: For convenience in reading, it is well to have the back and leg dynamometer placed on a small elevated platform. The dynamometer should in no case be attached to the platform or to the floor. In preparing the back lift the subject should stand with the center of the foot opposite the chain. If the individual stands forward too far he will tip backward, and if he stands too far backward he will be enabled to exert a leverage by swaying backward which will produce a spuriously large lift. He should stand at attention with the hands on the front of the thighs. The tester should then hook the handle into the chain so that the top of the bar is just below the tips of the fingers. The individual then bends forward at the hips and grasps the bar at the ends with one palm forward and one palm backward. The hands should be dried and dusted with chalk and partially wrapped around the bar, so as to gain as much aid from the friction of the skin of the hands as possible. After having exerted a maximum lift, the subject releases the back tension rather slowly. The tester then reads and records the record of the lift. It is seldom necessary to give more than one trial, as the first trial is usually better than subsequent trials.

3. Leg lift: The position of the feet is the same as in the back lift. The chain is adjusted so that the bar is placed across the thighs in the angle formed by the thigh and the trunk. The angle between leg and thighs at the beginning of the lift should be some-

what greater than a right angle, usually about 120 degrees. The hands should be close together and wrapped securely around the bar with palms backward. Elbows must be straight. The subject then raises head and chest and pulls as hard as possible with legs and arms.

Rogers has suggested that the tester aid the subject in holding the crossbar against the thighs by grasping the ends of the bar with his thumbs and the subject's thighs with the forefingers of each hand. With inexperienced subjects this aids materially in promoting the accuracy of the test.

It has been found best usually to rest the bar on the bare skin or upon a pad of relatively soft cloth. When it is realized that an adult male will frequently lift as much as eight hundred pounds with his legs, so that a pressure of four hundred pounds rests on each thigh, it can be seen that a slight slipping of the bar which draws coarse cloth, such as khaki trousers, over the skin may tear the surface of the skin away. This is not usually experienced with children but is worth keeping in mind.

No back or leg lift should be administered to any subject known to have hernia or to have been operated upon recently. The same is true of subjects who have serious heart defects.

4. Dipping or push-ups (Boys): The subject stands at the ends of the parallel bars, grasping the bars one in each hand. He jumps to the cross rest with arms straight (this counts one). He then lowers his body until the angle of upper arm and forearm is less than ninety degrees, and then pushes up to the straight arm position. He repeats this movement as many times as possible. In the executing of this movement, the body and legs of the subject should be approximately in a straight line, and under no circumstances should a jerk or kick be permitted. The subject is, however, permitted to do the exercise as rapidly as he wishes.

If the subject does not go down far enough or does not go all the way up to a straight arm position, a half credit is given. After four successive half counts, the exercise is stopped and the subject retested later.

5. Chinning or pull-up (Boys): At least five minutes should elapse between the dipping and the chinning. Use either a horizontal bar or a pair of small rings attached to a horizontal bar. The subject hangs by the bar or the rings and chins himself or pulls up until the chin is even with the hands or over the bar. He

then lowers himself until his arms are completely straight. Under no circumstances should he be permitted to kick, jerk, or to have a kip motion. Any such maneuver or failure to go clear down or clear up should count as a half movement. After four consecutive half movements the exercise is stopped and the subject retested later. The subject is permitted to chin himself as rapidly as he desires. The stronger boys usually prefer to chin and dip rather rapidly.

In both chinning and dipping, counting should be out loud, and the subject should be encouraged both before beginning the exercise and during the exercise to continue as long as possible.

6. Dipping or push-up (Girls): The girl places her hands upon the near edge of the stall bar bench in such a position that when she is in the front leaning rest position her shoulders will be directly above her hands. It is usually wise to have someone place a foot crosswise behind the balls of the subject's feet so that she will not slide backward on the mat. The subject then bends her elbows and with straight body lowers herself until the upper part of her chest touches the edge of the stall bar bench. She then pushes herself back to the straight arm position. In no case should she be permitted to raise and lower the hips out of line with the shoulders and feet. If the body sways or arches, or if she does not go clear down or does not push clear up, count only as one-half exercise.

7. Chinning or pull-up (Girls): The bar (or rings attached to the bar if these are used) should be at the height of the bottom of the sternum. To facilitate the administration and avoid undue adjustment of the bar, it is wise to line the class up according to height, beginning with the tallest. Particularly in the middle range of heights, the adjustment of the bar will then not be too frequent.

The subject should grasp the bar with palms upward or grasp the rings in such a position that, as she slides her feet under the bar with straight body, arms and body form approximately a right angle; and when she pushes up, the bar should come about an inch below the upper end of the sternum. The weight should rest upon her heels, and it is well to have some one place a foot sidewise under the insteps so that the feet will not slide on the mat. The girl should then pull up with straight body as many times as possible. If she sags or raises the hips during the performance, the "chin" should count as only half a movement. The same statements as to counting and motivation as given under the description of the boys' chinning will apply to the girls as well.

Norms for Strength

A number of variables have been suggested for determining the normal strength of the individual. The consensus of these studies has indicated that height is not important, but that sex, age, and weight are. For individuals of approximately normal weight, these measurements seem to be sufficient for all practical purposes. For the overweight and the underweight, however, some adjustments are in order.

The underweight individual will record a greater strength on the dynamometer, because of having to lift less body weight (increasing the numerator of the index) and will have a spuriously low norm (decreasing the denominator). Hence his index will be spuriously high. To correct for this, if the individual's normal weight and his actual weight are both available, *subtract* the difference from his actual strength total, and use his normal weight for obtaining the norm. This is highly accurate.

For the overweight person, however, the problem is not quite as simple. Overweight cuts down the amount lifted in the leg lift far more than just the amount of extra body weight to be lifted. At present, however, the amount that the actual strength index is reduced by overweight due to fat is not accurately known. The reduction is all in the back and leg lifts, and mostly in the latter. The overweight is automatically cared for in the chinning and dipping and does not affect the grips. At present, the most practical rule is: if the normal weight is known, add one and one-fourth times the difference between the actual and normal weights to the Strength Index and use the normal weight as the standard for determining the strength norm. This is an accurate index of his musculature. Overweight, however, reduces his physical efficiency, and is a problem in itself.

As was stated above, the individual's index or physical fitness index is given as the per cent his actual strength is of normal strength, based on sex, age, and weight. Since the norms given in this volume are based upon the records from a school system that may be looked upon as superior for this country, at least so far as adequacy of muscular development is concerned, it is suggested that the following divisions be made arbitrarily. (The standard deviation of the Physical Fitness Index for all groups studied (boys) was slightly over 12.)

PFI under 85; definitely subnormal; should be considered as handicapped for motor performance and physically apt to be in poor health. Should have a careful medical examination, even if the routine examination by the school physician has been negative.

PFI from 85 to 94: Low: Should be given a medical examination, but may be assigned to normal groups for physical activities. Will be however, somewhat handicapped for motor performance.

PFI from 95 to 104: Normal.

PFI from 105 to 114: Good—better than average.

PFI from 115 and over: Superior. Should be able to undertake any motor tasks pertinent to that age group.

From the standpoint of "probable health efficiency," anyone with a PFI below 90 should be suspected, and every effort should be made in the schools to bring all children up to at least the normal zone.

While it is advisable to use the whole battery of tests (grips, back lift, leg lift, pull-ups, and push-ups) to determine the Strength Index and, subsequently, the Physical Fitness Index, this will not be possible in some communities because of the cost of the apparatus. The next best thing is to use the so-called "short-form," which is composed of the sum of the strength of the two grips, the pull-up and the push-up strength. This is not as valid as the total Strength Index, but it is better than any one part of it alone. Norms for the "short form" are also included in the Appendix (Table 144).

Wherever this is not possible, the next best thing is to use the pull-up strength alone (for boys). A sort of "pull-up PFI" may be computed from this. Norms for this for boys are given in the Appendix (Table 145). The correlation of pull-up strength with total strength is high for boys, averaging about .92. For girls, however, this is not true; hence the substitution of pull-up strength (for girls) for the total strength index is not justified. For girls, the grip strength may be used, though this is far from satisfactory.

CHAPTER VIII

PHYSIOLOGICAL VARIANTS OF TYPE

In Chapter II the problem of body types was discussed and methods suggested for measuring and "typing" them. The treatment of the subject in that chapter, however, was general, and based solely upon statistical findings. The standards there suggested are primarily for the purpose of classification and for the statistical treatment of data.

There is another aspect of variation from the normal or average person for each sex which is not subject as yet to accurate and objective anthropometric measurement, but which complicates the problem of measuring and estimating physical status. This kind of variation may be called, for want of a better term, "physiological variants of type." We have chosen to discuss this subject after the treatment of measures of physical status rather than with general body types both because of a desire to gain perspective and because of the fact that the relationships to the measures of physical status are greater than the relationship to the general measurement of type.

Everyone who has measured several hundred different individuals has been struck with the fact that there are many deviations from the average in other than relative stockiness or general body build. Some males seem distinctly masculine. They have wide shoulders, large thorax, slender waist and hips, and slender legs. They have much face and body hair, deep voices, and possess other distinct marks of masculinity. Other males seem to be at the other extreme. They have relatively narrow shoulders, a slender thorax, wide hips, and calves whose major curve is on the outside. They have the female distribution of body hair, and may have high tenor voices. Females likewise exhibit body characteristics that range from the extremely feminine on the one hand to the extremely masculine on the other.

Nor are these the only variants. The configurations of bones of the face and mandible vary greatly from the smooth delicate bones with nonprominent jaws to the heavy glabella, heavy face, and rugged mandible of the acromegalic. The bony skeleton shows similar changes. It may vary from the delicate, slender boned skeleton to that in which one sees a coarsening of many of the bones and a particularly noticeable heaviness of the hands and feet. The thorax changes in the acromegalics, usually becoming deeper with an accompanying increase in the forward curve of the upper back. This shape of the thorax has been compared to that of the gorilla.

The relative proportions of the body also reveal vast differences, from the short-legged, long-trunked lateral to the relatively long-legged hyperlinear, frequently found among the high thyroid group. These phenomena present problems to the anthropometrist which complicate the matter of findings, and yet they frequently suggest opportunities for service.

These differences of body build and variants of type seem, so far as the studies of today throw light on the problem, to be compounded of at least two elements. Davenport (16) seems to have proven that at least one important element is that of straight gene heredity. He believes that he has evidence that stature and body build in general are the results of at least two or three, and in a few instances as many as four, determiners of heredity. There may be many more that influence physiological variation even more through indirect means by influencing the factors discussed below, but little is as yet known of these. In any case, the gene heredity cannot be changed after birth.

The second element, according to the studies summarized and presented by Stockard (60), is that of variability in the glands of internal secretion. Whatever may be the causes, many of these glands are subject to a wide range of function, relative to the size and needs of the individual. Many of these differences of glandular function produce marked differences in the anatomical structure, and result in distinct "type" differences in the individual. Careful observation of these phenomena may lead to a sufficient understanding of the needs of the subject that he may be referred to his physician for adequate treatment. The anthropometrist should be familiar with the effects that result from such abnormal deviates.

The text below will discuss in turn each of the glands that is important from the standpoint of differences in body build, pointing out the results of glandular over or under function only as they affect the body development. This oversimplified treatment of the subject has the advantage of clarifying the basic facts and preventing undue confusion. It has the disadvantage, however, of making it seem that the problem is much simpler than it really is.

From the point of view of the anthropometrist, enough is known of four of the glands of internal secretion, so far as their effect on growth and development is concerned, to justify this presentation here. These are the pituitary, the thyroid, the adrenal, and the sex glands or gonads. Some alleged facts will also be presented concerning the functioning of the thymus gland. These are very much interrelated so that marked changes in one frequently produce marked changes in the function of others. These interrelationships, however, are not always apparent.

Other glands, such as the pineal, the parathyroids, and the islands of Langerhans, while of great importance physiologically, are not known to produce marked changes of body type. We shall discuss only those that do.

GENERAL CONSIDERATIONS

As in most structures and functions of the human body, there is a wide range of variation in these functions. While such functions are hard to measure, where some of them can be measured indirectly, as through the basal metabolic rate, the variability is roughly according to the binomial curve of chance. In general, the part of the range near the average of this distribution represents that which is probably biologically best for the individual. Quantitative deviations can be in the direction of hyperfunction of a gland or of hypofunction. How far an individual can depart from the neighborhood of the average and still be considered as ''normal'' may depend as much upon the compensation provided by other and related glandular mechanisms as upon the abnormalities of one gland itself. In the description that follows immediately, the effect of hyper- and of hypofunction will be discussed for each gland alone, but primarily only as it affects the growth and structural development of the body.

The Pituitary Gland

The pituitary gland is located under the front part of the brain and is enclosed in a recess in the front of the cranial cavity, which is called the sella turcica. For purposes of this discussion the pituitary gland may be considered as being divided into two glands, the anterior or glandular lobe, and the posterior or nervous lobe, for the pars intermedia functions primarily with the posterior part. These two lobes function quite differently and constitute, in effect, two glands.

ANTERIOR LOBE

Hyperfunction of the anterior lobe of the pituitary gland usually results in (1) accelerated growth of the long bones, producing an individual of taller than average stature, and with the greatest length in the legs and arms. Hyperfunction of the thyroid has much the same result. Hyperfunction of the anterior lobe of the pituitary, however, usually results in a more rugged development of the frontal bone, particularly of the glabella (the part of the frontal bone underlying the eyebrows), and of the mandible, and a greater development of the whole bony face as well. In borderline cases this is especially noticeable in high cheekbones. The bones of the hands and feet in the high anterior pituitary are usually larger and more massive than in the average person, and this development of bones of the face, hands, and feet serves to differentiate to a large degree the long bone growth due to the anterior pituitary and that due to the thyroid and to the relatively late development of the gonads. The rest of the bony skeleton is also massively developed, but is not as apparent to inspection without the aid of the X-ray. Such acceleration of growth due to the anterior pituitary is usually also accompanied by an early pubescence and a well-marked development of the genital system. This, of course, also differentiates this condition of excessive long bone development from that caused by late pubescence. (See below.)

Tumors of the anterior pituitary result in a very unusual development of the body in the ways suggested above, and the results differ at different age levels. If this occurs in youth before the fusion of the epiphyses, the long bones grow with great speed and the child grows to heights far beyond the normal, but with the other marks of this condition enumerated above. This condition is usually termed *gigantism*. Most of the sideshow "giants" are from this group.

If the condition develops in adult life after the fusion of the epiphyses, the growth in height is negligible, but there is a vigorous growth of diameters of the bones, especially well seen in the bones of the hands and feet, and a further development of the glabella, zygomatic bones, and mandible, and secondarily of other parts of the face, resulting in the condition termed acromegaly.

Moderate hypofunction of this gland does not result in such readily discernible and identifiable results. The skeleton is much more delicate and grows less than is normal, especially in the long bones. In extreme cases there is definite dwarfism. In even moderate cases the bones of the face are underdeveloped, the chin is recessive, and the upper jaw has an over jet. The chest is usually flat and narrow, the abdomen protruding, and the umbilicus remains low, as in childhood. The skeletal proportions remain juvenile.

In the adult, the build of the male is apt to be decidedly feminine and the beard imperfect and rudimentary. In the female, the breasts are usually undeveloped. In both sexes, sex maturation is late and the development of the sex equipment is deficient.

POSTERIOR LOBE

From the point of view of body configuration, the only significant changes produced by this gland are in the deposits of fat. If there is hyperfunction, there is a reduced metabolic tolerance for carbohydrates, and a resulting lack of fat deposits on the body. If there is a hypofunction, there is an increased tolerance for carbohydrates, with a tendency to accumulate fat. Fat accumulated because of this condition tends to be deposited principally on the trunk, and the individual usually has arms and legs that are much freer from adipose tissue than would be expected from the amount deposited on the trunk. This is often termed "girdle fat." This underfunctioning is usually accompanied by a typical "peaches and cream" complexion. One type of disorder which is associated with dysfunction of the pituitary and secondarily of the sex glands is a condition known as *dystrophia adiposo genitalis.* Those suffering from this disorder exhibit extreme fatness as is the case with a hyposecretion of the posterior lobe of the pituitary, and a rudimentary development of the genitals. Males suffering from this disorder resemble fat females in build, having not only the fat pads of the female but the feminine configuration of the legs, and, not infrequently, an accumulation of fat on the breasts which may become so large as to resemble the female breast.

The functions of the anterior and of the posterior lobes of the pituitary gland are not necessarily highly related. There may be, for example, a hypersecretion of the anterior lobe and a hyposecretion of the posterior lobe.

THE THYROID GLAND

The thyroid gland is just above and behind the top of the chest bone, extending a little way up into the neck. The structural changes produced by the hyperfunction of this gland are seen in the acceleration of the linear type of growth and a relative diminution in the lateral or cross-sectional type of growth. This is seen somewhat more in the growth of long bones than in the vertical growth of the spine. It produces a person who is relatively tall and slender (a linear type), who has slender hands and feet, and a facial bony development that is not rugged, as is the case when excessive growth in height is due to the stimulus of the anterior pituitary. The thyroid secretion may stimulate the function of the gonads and accelerate the onset of puberty, which checks the linear growth in its later stages. If, because of an abnormal deficiency in the gonad development, this early pubescence does not appear, the individual grows much more tall, slender, and long-limbed than would otherwise be the case.

With the acceleration in the functioning of the thyroid, there is a general speeding up of the whole metabolic rate and an increase in the body temperature, and the teeth usually are more resistant to decay because of an accompanying increase in the calcium metabolism.

Successful experimentation has been done with the feeding of thyroid to increase the height of very much undersized children (Zuck (69)). This must be done well before the development of pubescence and will tend to change the build of the child from that of a lateral to that of a linear. Such treatment must, of course, be conducted by a competent medical endocrinologist.

Under- or hypofunction of the thyroid must be considered according to the age at which it occurs. In youth the result is the condition known as cretinism. The child has a greatly deficient development of long bones, and looks, usually, like a little old man. The skin is dry, puffy, and wrinkled; the face looks dull, and the basal metabolic rate is very low. The sex glands usually develop late and inadequately. The hair is dry, stiff, and brittle, and the nails are thin and brittle. The child is usually pot-bellied, has a thick tongue and lips, and lusterless eyes. The development of the bones of the face is uneven, and the root of the nose is usually depressed in what is generally termed a "saddle nose." The mental development is greatly retarded, and while if treated in time (by the proper feeding of glandular substances) the physical changes can be overcome, the damage to the mentality is usually permanent. This condition should, in every case, be looked for in infancy by the family physician, as the damages come relatively early.

If the condition does not occur before adulthood, it is known as *myxoedema*. There are no marked changes in the proportions of the body due to this disorder; but the skin of the face becomes thick and puffy, the skin of the body generally becames slightly swollen and somewhat dry, and in the exposed parts is covered with fine wrinkles. The teeth of the hypothyroid tend, either in youth or adulthood, to increased decay, due to a reduced calcium metabolism. The person usually becomes fat, and this fat is generally evenly distributed over limbs and trunk, contrasting with the girdle obesity of the hypoposterior pituitary.

THE ADRENAL GLANDS

The adrenal glands are found, sitting like cocked hats, on top of and to the front of the kidneys. They are divided into two parts, the cortex and the medulla. From the standpoint of influencing body type and development, only the cortex is of importance. Overfunction of the adrenal cortex results in a thoroughly adequate supply of physical energy, and a feeling of well-being. If the functioning is decidedly plus, the male tends to be extremely masculine in appearance. Unfortunately, the same is true in the female—she also appears decidedly masculine. She is very energetic, somewhat coarsely built, and usually has a masculine voice, much body hair, and frequently an excess of facial hair. In the extreme this is called *virilism*. In both sexes there is an accentuated development of the sex function.

When there is a hypofunction of the cortex of these glands, the opposite is true. The individual lacks in development of the chest, the breathing capacity is relatively low, and the person is usually underdeveloped and thin, partly due to a decreased sugar tolerance. The basal metabolic rate may be as low as 65 per cent of normal. Functionally, there is a great susceptibility to fatigue.

The adrenals are closely related to the pituitary, the thyroid, and the gonads, and the hypofunction of one may be, in some cases, compensated for by an increased functioning of one or more of the others.

THE GONADS

The gonads or sex glands are really made up of two organs in each sex. It is simply an evolutionary accident that they are in juxtaposition in one gland. In addition to the part of the gland that produces the sex cells (ova or spermatazoa) there is a set of cells known as the "interstitial cells of Leydig" which have no relationship to the reproductive function, but which are glands of internal secretion.

Let us define sex, so far as this chapter is concerned, as "the sum of the peculiarities of structure and function that distinguish a male from a female organism." (Hoskins (27, p. 170)) We are, therefore, concerned here primarily with the bodily changes that occur in the body, brought about by the functioning or lack of functioning of those glands.

The major differences of body structure between the sexes are common knowledge. The male has wider shoulders, a larger chest, larger breathing capacity, stronger arms, somewhat smaller hips, and less fat over the body, but especially over the hips and thighs. He has a deeper voice, and more hair on the face and body. The opposite is, of course, true for the female. The configuration of pubic hair is different for the two sexes, running in a point up the abdomen to the umbilicus in the male, while it grows straight across the lower abdomen in the female. In the male the major curve of the calf is on the inside of the leg, while the major curve of calf in the female is on the outside. In the female the mammary gland develops at and after pubescence.

Excess or hyperfunction of the gland in either sex accentuates the development of the secondary sex characteristics in the individual. A hyposecretion results in a lesser development of these qualities, and in some cases results in an almost neuter type of indi-vidual.

The gonadal secretion stimulates this increased long bone growth, but balances this by the fact that it also causes the epiphyses of these bones to unite earlier, and this stops the spurt of growth. Excessive development of the secretion will, however, result in a rapid spurt of growth at adolescence, followed by a fairly sudden stoppage of the spurt. This influence of the internal secretion of the gonads is extremely important in physical growth and should constantly be kept in mind in the interpretation of growth data, particularly in the case of individual growth curves. The individuals with a hyposecretion usually grow more slowly, but because of a late puberty grow for a longer period of time.

The effects of a deficiency of secretion are seen in castrates. In animals, these frequently grow larger (as in capons), but they are usually more flabbily muscled ("have more tender meat") and are much less energetic than the normal animals. In humans who have been deprived of their sex glands before puberty, as in the case of eunuchs, the long bones grow much longer, and very tall individuals result. These males tend to have wider hips and narrow shoulders, with the fatter hips and legs of the female. The voice remains soprano or alto, and facial hair is very scanty or absent.

In the case of males deprived of these glands in adult life, the facial and bodily hair becomes scantier, the voice changes somewhat, and the energy usually sharply diminishes. Females deprived of their ovaries in early life are prone to add body and facial hair, and to fail to develop the breasts and other bodily contours of the typical woman.

Where the secretion is deficient (hyposecretion), there is a tendency, seen especially in the female, for the individual to become irritable, hyperemotional, and possessed of much self-pity. In either sex, the person is apt to be a weak, whining personality, economically a failure, and depressed and sluggish.

In the male, at least, hyperfunction is usually associated with a larger number of red blood corpuscles, and also with a somewhat higher normal systolic blood pressure and a higher basal metabolic rate.

It has been found that in a number of cases the interstitial cells of both sexes are present in one individual. It is then possible for the person to exhibit some of the body characteristics of both sexes, and yet to have an ample supply of internal secretion of his or her own sex. This is possible because of the fact that the embryological beginnings or *Anlagen* of the glands of both sexes are present in the embryo, and sometimes the interstitial cells of the opposite sex fail to disappear entirely.

These glands are closely associated with the function of the anterior pituitary, the thyroid, and the adrenal cortex, and are stimulated by oversecretion of any of them. The gonad secretion, stimulated by the anterior pituitary secretion, acts to check the excess growth produced by the anterior pituitary. The mechanism of this is based on the fact that (1) the anterior pituitary secretion accelerates the time of the onset of maturation of the gonads, and (2) the activity of the interstitial secretion of the gonads causes the epiphyses of the bones to unite in a relatively short time after that, thus stopping linear growth.

THE THYMUS GLAND

The literature on the relationship of the thymus gland to physical development is very scanty. About the most suggestive study that has been done on the subject is that by Shellshear (55). Dr. Shellshear had available the abundant human autopsy material of the island of Hong Kong, and he found that the thymus gland, which had been thought to atrophy and undergo a complete fatty degeneration after puberty, did not undergo such a change in all cases. Grading the thymus glands from completely degenerated to almost totally functional, he found that where there was a persistently functional thymus in the adult, there was a persistence of adolescent build with a lack of development of the secondary sex characteristics. Where the degeneration was complete, there tended to be a more complete development of those postadolescent or adult characteristics. Thus there seems to be a reciprocal relationship between the functional development of the gonads and these secretions, in so far as these affect the development of secondary sexual characteristics. Whether this is due to the effect of gonads on the thymus, or of the thymus on the gonads is not entirely clear. Usually the underdevelopment of the adrenals is accompanied by an overdevelopment of the thymus, and the same is frequently found true in overfunction of the thyroid. Pending further work, this is only suggestive.

MIXED RELATIONSHIPS

The treatment of the subject of internal secretions given above is decidedly oversimplified. In most cases the glands work in groups, not one at a time, and most people who are deviates from the average (though by far the largest number *are* average) are the result of a number of glandular (and other) influences. It is only by studying them one at a time, however, that the norms and deviations from the norms are understood. Even experts in this field are cautious in their diagnoses of the endocrinal causes of body types.

On the other hand, the endocrines do produce decided deviations from the normal, and to understand those individuals one must understand the causes. Probably the best advice one can give is to study the endocrines and their effect on growth;[1] to observe carefully for a number of years; and to draw conclusions cautiously. Only in this way will one be able to understand and explain numerous "physiological variants of type."

In the use of the standards given in this volume it will occasionally be found that individuals who to the eye appear normal and healthy nevertheless deviate markedly from the standard. In almost every case, these will be found to be those who are such physiological variants of type. Women who are decidedly masculine in build and who have wide shoulders, large chests, and narrow hips will be found to have overly large breathing capacities, but they will be, according to the standards, underweight. The latter is because they do not possess the hip and thigh fat pads of the typical female. On the other hand, males with a feminine build are usually low in breathing capacity and high in weight. Hence, in cases where there is a marked deviation from the normal, the measurer should carefully appraise the subject subjectively to seek a possible natural explanation of the facts found.

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[1] An excellent presentation of this subject which avoids the too abstruse language of the pure physiologist will be found in Hoskins (27).

CHAPTER IX

BREATHING CAPACITY

By breathing capacity is meant the measured amount of air that an individual can breathe out by forced exhalation following as full an inhalation as it is possible for him to take. This has also been called in the literature "lung capacity" and "vital capacity." The first term, lung capacity, seems to us a misnomer, for this measurement does not determine the capacity of the lungs, since after the complete exhalation there is still left the residual air which cannot be exhaled. The term vital capacity is quite meaningless and misleading and is based upon questionable assumptions. What is really meant is the amount of air that can be breathed out; hence we have selected for use the term adopted by Dr. Bird T. Baldwin, first director of the Iowa Child Welfare Research Station, "breathing capacity of the lungs."[1]

Breathing capacity has long been used as one measure of physical status, usually in the form of an index expressed as a percentage of the norm for the individual. As was stated in *Appraising Physical Status: The Selection of Measurements,* the best measurements to use as norms for breathing capacity are probably yet to be determined. At present, sex, age, height, and normal weight seem to be as satisfactory as any other combination.

It is common to find that the correlations with different variables and breathing capacity are reduced between the ages of fourteen and seventeen, the period of adolescence. Recent findings on motor performance, height, and weight show that with other variables held constant, these three have a relatively high correlation with physiological age or state of pubescence.[2] This renders it desirable that eventually separate tables be prepared for the different stages of pubescence during the period covered by these ages.

There seems to be some relationship between build and breathing capacity, although as yet this has not been statistically determined. The more slender, not too heavily muscled, individual of the linear type seems to have a greater breathing capacity for his height and weight than does the more stocky, heavily muscled, lateral type. The cause of this phenomenon and the reasons for exceptions to it are not as yet known.

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[1] The history of the studies in breathing capacity and of the uses of the measurement of breathing capacity can be found in Myers (43).

[2] Unpublished studies at the Iowa Child Welfare Research Station.

To make the measurement of breathing capacity as accurate as possible, a wet spirometer with standard calibrations should be used, and the water in the spirometer should be kept as nearly as possible at a constant room temperature of 24° to 26° Centigrade or 75° to 79° Fahrenheit. Otherwise the resultant changes in the volume of expired air plus the precipitation of excess water vapor will cause the volume to vary greatly, which will give decidedly erroneous results (37).

The subject should thoroughly understand the technique of blowing into the spirometer. No standardized instructions as to technique have seemed desirable, since the standardized techniques are apt to act as much as intelligence tests as standardizers of the breathing capacity. The examiner should see that the subject really does know what he is expected to do, and that he does it to the limit of his capacities. A little competition with himself and other subjects will frequently work wonders.

STANDARDS OF BREATHING CAPACITY

Mrs. Helen Garside Kelly (31) of this Station has presented studies of breathing capacity for ages twelve to eighteen. These are computed from height and weight in English units and give breathing capacity in cubic inches.[1] Since most of the spirometers

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[1] Those measuring in metric units can readily adapt these tables to their use by simply writing the metric equivalents in beside the English units on the two scales. This will still give the breathing capacity in cubic inches, but since most American spirometers are so calibrated, this is not undesirable.

The eighteen-year-old standards are also applicable to ages beyond this up to about thirty-five years of age. After thirty-five there is a progressive falling off in breathing capacity until at seventy-five years of age it is only 62 per cent of normal. According to Bowen and Platt (Arch. Internal. Med., 1923, 31, 579) this decrease in breathing capacity with age is as follows:

Age	Per Cent
35	100
40	98
45	95
50	93
55	86
60	80
65	74
70	69
75	62

Table 18

T-Scores for Breathing Capacity Index $\sqrt[3]{\frac{\text{Breathing Capacity}}{\text{Standing Height}}}$: Males

T-Score	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.0292	.0294	.0295	.0298	.0298	.0292	.0287	.0285	.0285	.0285	.0281	.0276	.0276	.0283	.0290
5	.0298	.0300	.0301	.0304	.0304	.0298	.0294	.0292	.0292	.0293	.0289	.0285	.0285	.0291	.0298
10	.0304	.0306	.0307	.0310	.0310	.0305	.0300	.0299	.0299	.0300	.0297	.0293	.0293	.0299	.0305
15	.0310	.0312	.0313	.0316	.0316	.0311	.0307	.0306	.0306	.0308	.0305	.0302	.0302	.0307	.0313
20	.0316	.0318	.0319	.0322	.0322	.0318	.0314	.0313	.0313	.0315	.0313	.0310	.0310	.0315	.0320
25	.0322	.0324	.0325	.0328	.0329	.0324	.0321	.0320	.0320	.0323	.0321	.0319	.0319	.0323	.0328
30	.0328	.0330	.0331	.0334	.0335	.0330	.0327	.0326	.0327	.0330	.0329	.0327	.0327	.0331	.0335
35	.0334	.0336	.0337	.0340	.0341	.0337	.0334	.0333	.0335	.0338	.0337	.0336	.0336	.0339	.0343
40	.0340	.0342	.0343	.0346	.0347	.0343	.0341	.0340	.0342	.0345	.0345	.0344	.0344	.0347	.0350
45	.0346	.0348	.0349	.0352	.0353	.0350	.0347	.0347	.0349	.0353	.0353	.0353	.0353	.0355	.0358
50	.0352	.0354	.0355	.0358	.0359	.0356	.0354	.0354	.0356	.0360	.0361	.0361	.0361	.0363	.0365
55	.0358	.0360	.0361	.0364	.0365	.0362	.0361	.0361	.0363	.0368	.0369	.0370	.0370	.0371	.0373
60	.0364	.0366	.0367	.0370	.0371	.0369	.0367	.0368	.0370	.0375	.0377	.0378	.0378	.0379	.0380
65	.0370	.0372	.0373	.0376	.0377	.0375	.0374	.0375	.0377	.0383	.0385	.0387	.0387	.0387	.0388
70	.0376	.0378	.0379	.0382	.0383	.0382	.0381	.0382	.0385	.0390	.0393	.0395	.0395	.0395	.0395
75	.0382	.0384	.0385	.0388	.0390	.0388	.0388	.0389	.0392	.0398	.0401	.0404	.0404	.0403	.0403
80	.0388	.0390	.0391	.0394	.0396	.0394	.0394	.0395	.0399	.0405	.0409	.0412	.0412	.0411	.0410
85	.0394	.0396	.0397	.0400	.0402	.0401	.0401	.0402	.0406	.0413	.0417	.0421	.0421	.0419	.0418
90	.0400	.0402	.0403	.0406	.0408	.0407	.0408	.0409	.0413	.0420	.0425	.0429	.0429	.0427	.0425
95	.0406	.0408	.0409	.0412	.0414	.0414	.0414	.0416	.0420	.0428	.0433	.0438	.0438	.0435	.0433
100	.0412	.0414	.0415	.0418	.0420	.0420	.0421	.0423	.0428	.0435	.0441	.0446	.0446	.0443	.0440

Table 19

T-Scores for Breathing Capacity Index $\sqrt[3]{\frac{\text{Breathing Capacity}}{\text{Standing Height}}}$: Females

T-Score	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	20 Years
0	.0271	.0270	.0270	.0274	.0273	.0273	.0279	.0281	.0282	.0282	.0277	.0266	.0261	.0261	.0261
5	.0279	.0278	.0278	.0281	.0280	.0280	.0286	.0288	.0289	.0289	.0284	.0274	.0270	.0270	.0270
10	.0286	.0285	.0285	.0288	.0287	.0287	.0292	.0294	.0295	.0295	.0291	.0282	.0278	.0278	.0278
15	.0294	.0293	.0293	.0295	.0294	.0294	.0299	.0301	.0302	.0302	.0298	.0290	.0287	.0287	.0287
20	.0301	.0300	.0300	.0302	.0301	.0301	.0305	.0307	.0308	.0308	.0305	.0298	.0295	.0295	.0295
25	.0309	.0308	.0308	.0309	.0308	.0308	.0312	.0314	.0315	.0315	.0312	.0306	.0304	.0304	.0304
30	.0316	.0315	.0315	.0316	.0315	.0315	.0318	.0320	.0321	.0321	.0319	.0314	.0312	.0312	.0312
35	.0324	.0323	.0323	.0323	.0322	.0322	.0325	.0327	.0328	.0328	.0326	.0322	.0321	.0321	.0321
40	.0331	.0330	.0330	.0330	.0329	.0329	.0331	.0333	.0334	.0334	.0333	.0330	.0329	.0329	.0329
45	.0339	.0338	.0338	.0337	.0336	.0336	.0338	.0340	.0341	.0341	.0340	.0338	.0338	.0338	.0338
50	.0346	.0345	.0345	.0344	.0343	.0343	.0344	.0346	.0347	.0347	.0347	.0346	.0346	.0346	.0346
55	.0354	.0353	.0353	.0351	.0350	.0350	.0351	.0353	.0354	.0354	.0354	.0354	.0355	.0355	.0355
60	.0361	.0360	.0360	.0358	.0357	.0357	.0357	.0359	.0360	.0360	.0361	.0362	.0363	.0363	.0363
65	.0369	.0368	.0368	.0365	.0364	.0364	.0364	.0366	.0367	.0367	.0368	.0370	.0372	.0372	.0372
70	.0376	.0375	.0375	.0372	.0371	.0371	.0370	.0372	.0373	.0373	.0375	.0378	.0380	.0380	.0380
75	.0384	.0383	.0383	.0379	.0378	.0378	.0377	.0379	.0380	.0380	.0382	.0386	.0389	.0389	.0389
80	.0391	.0390	.0390	.0386	.0385	.0385	.0383	.0385	.0386	.0386	.0389	.0394	.0397	.0397	.0397
85	.0399	.0398	.0398	.0393	.0392	.0392	.0390	.0392	.0393	.0393	.0396	.0402	.0406	.0406	.0406
90	.0406	.0405	.0405	.0400	.0399	.0399	.0396	.0398	.0399	.0399	.0403	.0410	.0414	.0414	.0414
95	.0414	.0413	.0413	.0407	.0406	.0405	.0403	.0405	.0406	.0406	.0410	.0418	.0423	.0423	.0423
100	.0421	.0420	.0420	.0414	.0413	.0413	.0409	.0411	.0412	.0412	.0417	.0426	.0431	.0431	.0431

now in use in the United States give readings only in cubic inches, it seemed desirable to compute these norms in this form. The volumes given are for room temperature of the water.

Breathing capacity of the individual should be interpreted in the form of an index number (Table 18 and 19) or percentage deviation above or below the norm. In comparing such percentage deviations with deviations of linear measurements from group averages, it should be remembered that a variation of 16 per cent in a *volume* such as breathing capacity or weight is of approximately the same significance as a variation of 5 per cent in a linear dimension. This may be explained crudely by the fact that a volume varies in three dimensions, and hence the total will vary as the cube of a linear dimension. To reduce this volumetric variation to a linear equivalent, use the cube roots of the deviations. For example, a falling off from 300 to 270 cubic inches is a drop of 10 per cent in volumetric units. $\left(\frac{270}{300} = .90\right)$ If the cube roots are compared, $\sqrt[3]{\frac{270}{300}} = .965$, a falling off in linear equivalents of only 3.5 per cent.

The influence of disease on the breathing capacity has been elaborately discussed by Myers (43), and his findings may be summarized here. There are two types of pathological factors influencing breathing capacity. The first consists of conditions that cause a reduction in the breathing capacity but which have no marked significance. So far as children are concerned, these may be illustrated by such things as old pleural adhesions, certain deformities of the thorax, premature ossification of the costal cartilages, lack of will power, and malingering. The second type consists of pathological entities which have definite clinical significance, such as cardiac disease, hyperthyroidism, asthma, emphysema, bronchitis, pleurisy, pneumo-thorax, pulmonary abscess, bronchiectasis, pneumonia, and pulmonary tuberculosis.

Not all of the diseases falling under these classifications produce a decided reduction in breathing capacity. The most of them, however, do produce such a reduction, and not infrequently this reduced breathing capacity may be the first significant symptom found, particularly in the more chronic conditions.

If there is an excess or supernormal breathing capacity at the beginning of the pathological process, the reduction may not be noticeable at the time of the examination. This makes it advisable to have comparable records kept in schools from year to year in order that any reduction from the individual's normal may be seen. The change in the breathing capacity varies with the clinical course of the disease, improving with an amelioration of the disease process and dropping off when the disease is aggravated. Since allowance must be made for normal growth of the child in comparing present readings of breathing capacity with past readings, it is advisable that the indices be compared rather than the original readings.

It has usually been suggested that a variation of 15 per cent under the normal for a given height and weight is almost certain to be medically suspicious and calls for a careful medical examination. With the development of better norms which take into account individual variations in build, it should be possible to reduce this to 10 per cent. At the present time it is the feeling on the part of many clinicians of experience that any child whose breathing capacity is 10 per cent below normal should be watched.

Several studies are available in the field of the relationship of breathing capacity to general capacity. Myers (43) has found that for carefully selected freshmen college students the norms are distinctly higher than for the unselected group. Turner's (63) careful study of college women gives the results of a thorough clinical and analytical examination of two groups of students, one a group of thirty-one with low breathing capacity, and the other a group of twenty-six with high breathing capacity. Of the group with low breathing capacity, eighteen were selected because of the fact that they did not improve their records upon subsequent examinations. Of those eighteen, eleven reported shortness of breath. The largest per cent elected relatively inactive sports. Few of them had a record of precollege participation, though seven reported some swimming. Some of the comments of their home physicians were as follows: "A little down." "Not robust, ptosis." "Advise restricted exercise." Six of the group were conspicuously underweight, and only three were up to the weights given in the usual tables.

Of the twenty-six who were 15 per cent or more above the average, only one reported shortness of breath. A large majority elected the strenuous sports, fifteen reported much swimming all the year round, only two reported little exercise, only five were conspicuously underweight. No comments except good ones were made by their home physicians.

Turner comments as follows: "In general appearance there is a difference between the two groups. One can usually tell to which group an unknown student belongs before she gives her name. The students of high vital capacity are much more 'fit' than those of low capacity. When the individual records were gone over, there were only two students in the low groups whose low record seemed to be associated with no other unfavorable finding and of the students in the high group, none had a poor record in other ways."

Campbell's (9) study showed that breathing capacity that was 10 per cent below the standard is evidence of unfitness, but that 10 per cent above the standard does not mean necessarily that the individual is fit. He found that out of fourteen who were classified as being more than 10 per cent below normal, ten were classified as below average in fitness while only one was classified as above average. There was little significant difference, however, in the distribution between plus 10 per cent and minus 10 per cent. He also found that competition and effort on the part of the individual resulted in raising the record by as much as 5 per cent.

It would scarcely seem necessary to state the fact that the two sexes should be judged from separate standards. One does need, however, to call attention to the fact that the different races cannot necessarily be judged from the same standards. It has been found that the colored race almost invariably runs from 7 to 25 per cent lower in breathing capacity than does the white race (58). This difference seems to be correlated, however, with the relative sitting height. The colored race have longer legs and shorter trunks, hence it would seem that if standards for the white race are used for the colored race, the standards based on weight are more accurate than those based on height. Studies based on surface area show a difference of from 15 to 20 per cent in children, with the white race having the larger capacity (50).

In conclusion, in the light of our present knowledge it would seem that breathing capacity should be measured as a routine under conditions that will insure accuracy of measurement, and that norms for the individual should be determined as accurately as possible from a number of significant variables. All children whose breathing capacity is as much as 10 per cent below this standard should be carefully examined by a physician and put upon a regimen calculated to bring the individual up to normal. These records should be available in terms of percentages of the norm of the time, and should thus be made available to the family physician and others who desire to compare present status with past performance.

There is need for much intensive research in this field, directed primarily towards reducing the error of prediction of norms by some variation of the multiple regression technique. Such norms would render the relative breathing capacity much more sensitive as a partial indicator of current physical status.

CHAPTER X

THE PROBLEM OF AGE

The growth and development of the body is very intimately correlated with the process of *maturation,* and this, in turn, is closely related to time. For this reason, *chronological* age has, from the beginning of studies of physical growth, been used as the measure of the extent of maturation. While this in general is relatively satisfactory, it possesses certain shortcomings and inadequacies as a measuring standard.

In the first place chronological age is computed as from birth. But birth is, from the standpoint of time, an instable starting point. Living children frequently range from less than seven months to as much as ten months of intrauterine age. A ten-months baby is three months "older" at birth than a seven-months baby. This is a large percentage at six months of postnatal age.

In the second place, the postnatal speed of maturation differs with different children. If we consider the *average* amount of maturation at each year of chronological age as the "normal physiological age," it is found that at each year of life the physiological age varies greatly. At the age of fourteen, it normally varies at least from eleven to seventeen, with the vast majority, as is usual with such physical changes, clustered around the average. Hence, when we utilize physiological age or maturational age units instead of chronological age years to measure maturity, we may say that a fourteen-year-old boy or girl (chronological age) may be anywhere from eleven to seventeen or eighteen years of age (in maturation units).

It is not accurately known at this time how closely physiological, maturational age is related to mental development. It is known, however, that the spurt of growth in the human is related to the time of the maturation of the gonads, and that the whole growth speed pattern is related to whatever mechanism it is that determines this physiological maturation.

At the present time, there are two methods in common use that measure physiological or maturational age: (1) the stage of pubescence, and (2) X-ray findings.

ESTIMATION OF MATURATION BY THE MEANS OF THE STATE OF THE PUBIC HAIR

One of the means of estimating maturational age is to note the time of the appearance of sexual maturity. This method has the shortcoming that it cannot be used before sexual maturity, and must be noted *at the time*, or it cannot be accurately utilized afterwards. It is, therefore, a landmark rather than an accurate measurement. Furthermore, there is no certainty that the speed of maturity both before and after sexual maturity will be constant. The method has uses, however, and suggestions for its utilization will be given here.

In the female, the date of menarche is the most satisfactory landmark. When possible, this should be recorded at the time and not left to memory. The girl will usually remember it vividly enough for a number of months, so that if it has not been recorded at that time, the date may be elicited by questioning later in the same year.

In the male, there is no similar dramatic event to record. The usual procedure is to base the change upon the state of development of the pubic hair. Three stages are recorded:

1. Prepubescence: This stage begins at conception and continues until the onset of the transition stage which is called pubescence, and which usually comes from eleven to seventeen years of age. (The average is at about thirteen with girls and fourteen with boys. See below.) During this time, there is no pubic hair except the fine hair present all over the body. At this time the external genitalia are usually quite childlike and undeveloped.

2. Pubescence: This is the stage at which the change from prepubescence to postpubescence becomes evident. Its beginning is indicated by the onset of a relatively rapid growth of the fine pubic hair, mentioned above, and the time of the beginning of pubescence is usually taken as that time when the growing pubic hair first shows pigmentation. At this time there is seen a beginning acceleration in the development of the genitalia.

3. Postpubescence: Pubescence is generally held to end and postpubescence to begin with the first appearance of a kink or twist in the pubic hair.

These standards are not entirely satisfactory. In a very small number of individuals, the pubic hair never kinks appreciably, and the onset of postpubescence must be determined from the general amount of pubic hair and the development of the external genitalia.

While the method has its shortcomings, its general availability is in its favor.

A number of studies of pubescent age have been made. The most significant are those of Crampton (15) and of Burdick and Brown (3), the data of which were analyzed by Baldwin (4), Dimock (18), Boas (8), Van Dyke (66), Shuttleworth (57), and Flory (22). From these studies a number of findings stand out.

1. The range of age at which one finds the onset of growth of pubic hair is from 9 1/2 to 18, and the mean age is about 13 years, 8 months for girls (Baldwin) and 14 years for boys (Burdick). Country children mature about half a year earlier than city children. At no given chronological age do as many as 40 per cent reach maturity.
2. Individuals who have reached pubescence at any given chronological age are, on the average, much taller and heavier than those who at that age have not reached pubescence. For example, at 14 years of age, the average postpubescent boy "excells the average prepubescent boy by 4 1/2 inches in height and almost 23 pounds in weight." (Dimock (18))
3. The most rapid growth is in the year when the individual passes from pubescence to postpubescence (Dimock (18), Boas (8)). This is the year preceding the onset of menarche in girls. (Boas (8))
4. Dimock (18) reports that the amount of growth that accompanies the change from pubescence to postpubescence is about the same in boys of 12, 13, and 14.
5. Individuals who are tall for their age usually mature earlier than those who are short for the same age. This is probably just another way of saying that individuals who are physiologically older are taller. After maturing, growth falls off sharply, especially in height, and less quickly in the horizontal dimensions and in weight.

The author studied the distribution by ages of pubescence in 1,075 junior high school boys and 705 junior high school girls from the Detroit public schools. These data were obtained through the courtesy of Miss Mary Delaney and Mrs. Paul Vollmer of the Detroit Public Schools. The distributions of ages for boys (taken to the last birthday) were as follows (See also Figure 6.):

	Prepubescent		Pubescent		Postpubescent	
Age Years	Number	Per Cent	Number	Per Cent	Number	Per Cent
17					6	100.0
16	1	2.4	6	14.3	35	83.3
15	18	10.4	62	35.6	94	54.0
14	98	28.3	141	40.6	108	31.1
13	162	56.1	98	33.9	29	10.0
12	151	85.8	24	13.6	1	.6
11	33	100.0				
10	4	100.0				

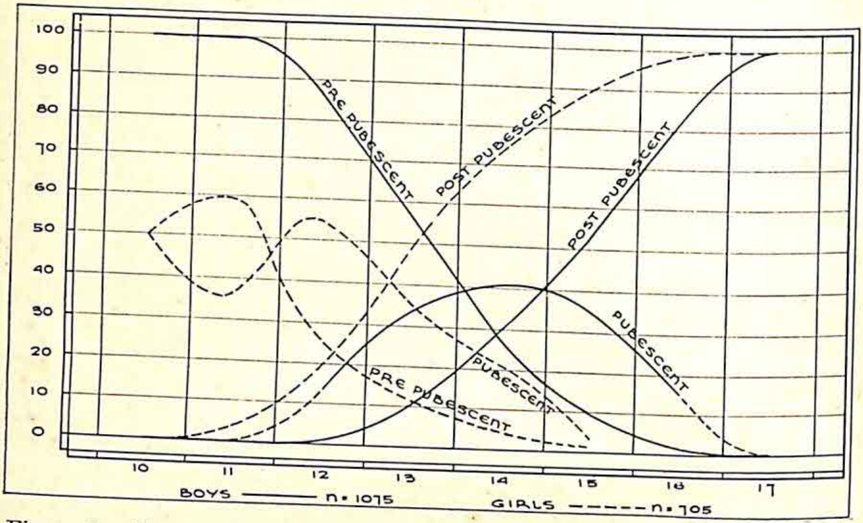

Figure 6. Stage of Pubescence in Junior High School Boys and Girls

Percentages are of that age. The average of pubescence is at 14 1/2, while the average age of the onset of postpubescence is about 15 1/4.

The average age of pubescence of girls is approximately 12 1/2.

	Prepubescent		Pubescent		Postpubescent	
Age Years	Number	Per Cent	Number	Per Cent	Number	Per Cent
17					1	100.0
16					21	100.0
15	2	1.5	4	3.1	122	95.4
14	8	4.0	40	20.2	150	75.8
13	25	12.3	76	37.4	102	50.3
12	33	25.8	68	53.1	27	21.1
11	14	58.3	9	37.5	1	4.2
10	1	50.0	1	50.0		

It is possible that this difference between the boys and the girls is partially at least a function of the method of grading. The boys were graded by the pubic hair criterion. In the case of girls, postpubescents were those in whom the menarche had taken place. Pubescents were those who had not menstruated, but in whom there were signs of changes in the secondary sexual characteristics, such as the beginning development of the breasts, and fat pads on the back of the arms or on the hips. The prepubescents were those in whom there were no such observable signs of maturity, and in whom the menarche had not occurred. It was not possible to observe the pubic hair in this group. If the onset of menarche be taken as the criterion, the average age would be recorded as 13 1/2, the age at which 50 per cent of the girls were postpubescent.

Perusal of Crampton's extensive and well analyzed data on boys (15) showed that postpubescent boys of 13 to 13 1/2 years are decidedly heavier than prepubescent boys of 15 1/2 to 16, and the same proportions hold elsewhere. The same was true of height.

Crampton (15) also presented data bearing on the relationships of grip strength and pubescence. This was converted by the present author to correspond with the weight of the individual. When weight was plotted against strength, the prepubescents averaged about 1 1/2 to 2 kilograms weaker than pubescents of the same weight, and from 5 to 6 kilograms weaker than postpubescents of the same weight (but younger).

Another study was made in which age, height, and weight were all included by means of an empirical formula ($8A_{\text{yrs.}} + .5H_{\text{cms.}} + 2W_{\text{kgms.}}$). Here the prepubescent and pubescent groups did not differ greatly, but the postpubescents of the same age, height, weight index (but usually younger, since they were taller and heavier than prepubescents and pubescents of the same age) were, on the average, from 3 to 7 kilograms stronger in grip, over the small range where they overlapped, and the lines of best fit were diverging. Five kilograms, on the average, would be 12 per cent of the total grip strength.

It is apparent, from this cursory survey of the literature, that successive stages of pubescence are accompanied by greater increments in growth, and also in motor development. It is not clear from the literature whether this is primarily due to a real difference in maturational age, or whether it is something superimposed upon it.

A study was made in this laboratory of the relationship of physiological age (as determined by the pubic hair criterion) and height, weight, strength, and general athletic ability. The group selected consisted of 220 junior high school boys from the Neinas Intermediate School in Detroit, Michigan. This school had a small playground and was limited in its general sports program, and so had specialized heavily in individual athletics of the track and field variety. All children markedly underweight (20 per cent) or overweight (30 per cent) were eliminated from the study, as were those recently ill, or those who had recently undergone surgical treatment. All others were included.

The data collected were: chronological age, height, weight (nude), stage of pubescence, strength (computed from pull-up strength), and athletic ability (from a combination of four athletic events: the 100 yard dash, the standing broad jump, the running high jump, and the 8 pound shot put). All anthropometric measurements and observations of physiological age were made by the author, and the athletic and strength tests were administered by the teacher of physical education of the school.

To correlate pubescence with each of the other variables, a method of triserial correlation was devised (See Appendix to this chapter p. 123-124. To reduce the range, the group was divided into five groups of one year each, but overlapped each six months. These groups were ages 13 years to 13 years, 11 months; 13 years, 6 months to 14 years, 5 months; 14 years to 14 years, 11 months; 14 years, 6 months to 15 years, 5 months; and 15 years to 15 years, 11 months. It was hoped by using this arrangement to reduce the range to the point that it might validly be assumed that the distribution of "the state of pubescence" within each group might be considered to be normal —a postulate necessary to this method of correlation. The items of pubescence, chronological age in months, height, weight, athletic performance, and arm strength, were then intercorrelated. All correlations with pubescence were done by the above mentioned triserial r method, while all others were computed by the product-moment method. Athletic performance was measured by summing the records of the four athletic events by means of scoring tables. Arm strength was computed from the weight and the ability to pull up on the horizontal bar, using the author's formula (35).

The number of cases in each group, the percentage in each pubescence category, and the intercorrelations are given in the following tabulation. Referring to data in this tabulation, it will be seen that pubescence correlates very slightly with chronological age, as would be expected from the small age range. The correlations with the other variables, however, are large. In view of the small age range, this is the more notable. The effect is most noticeable in the age groups from 14 years to 15 years, 5 months, when the maturation process is most active in boys.

To facilitate interpretation of the data, a number of partial correlations were computed. These also will be found in this tabulation. In these partial correlations, it is found that when height and weight are constant, the correlation of pubescence and chronological age is indeed negligible. The correlations of pubescence with height and with weight are high. It is particularly significant that the correlation of pubescence with athletic performance and with arm strength is high, even with chronological age, height, and weight

Relationship of Pubescence to Motor Performance

Age	13 Years, 0 Months to 13 Years, 11 Months	13 Years, 6 Months to 14 Years, 5 Months	14 Years, 0 Months to 14 Years, 11 Months	14 Years, 6 Months to 15 Years, 5 Months	15 Years, 0 Months to 15 Years, 11 Months
Number	74	86	95	79	60
r_{01}	.2088	.1203	.2327	.2756	.1424
r_{02}	.6895	.5158	.5385	.7531	.7853
r_{03}	.6728	.5499	.5783	.7996	.8170
r_{04}	.2610	.2915	.4884	.6326	.5474
r_{05}	.6286	.5361	.7028	.8435	.7917
r_{12}	.2499	.0434	.1573	.3936	.1253
r_{13}	.2003	.0215	.2618	.2473	.1720
r_{14}	.0148	.2324	.3656	.2180	.1053
r_{15}	.2351	.0689	.3602	.2384	.1815
r_{23}	.7724	.8147	.7446	.8199	.7967
r_{24}	.4382	.4399	.4068	.5724	.6439
r_{25}	.6147	.6207	.6343	.7190	.7558
r_{34}	.3904	.5097	.6308	.6558	.6027
r_{35}	.8810	.8925	.9034	.9016	.8988
$r_{01.3}$	.1021	.1299	.1033	.1339	.0033
$r_{01.23}$	.0508	.0681	.1174	.0403	.0118
$r_{02.1}$	.6730	.5148	.5226	.7294	.7816
$r_{02.3}$	.3614	.1400	.1982	.2836	.3857
$r_{02.13}$	.3516	.1356	.2222	.2371	.3860
$r_{03.1}$	.6586	.5514	.5406	.7853	.8127
$r_{03.12}$	.3049	.2655	.2729	.4765	.5074
$r_{04.3}$	−.0025	.0156	.1953	.2385	.1195
$r_{04.23}$	−.0960	.0087	.2255	.2255	−.0131
$r_{04.123}$	−.0911	−.0121	.2031	.2239	−.0132
$r_{05.3}$	.1026	.1203	.5157	.4719	.2271
$r_{05.23}$	.1997	.1960	.5583	.5179	.1856
$r_{05.123}$	.1942	.1887	.5519	.5168	.1852

KEY TO SYMBOLS

x_0 = pubescence
x_1 = age
x_2 = height
x_3 = weight
x_4 = athletic performance
x_5 = pull-up strength

held constant. This is more significant with arm strength than it is with athletic ability. Both show their greatest significance between 14 and 15 1/2 years of age. The correlations of pubescence with height, when age and weight are held constant, and with weight, when age and height are held constant, are significant at all ages studied.

From these facts, it would seem clear that the state of pubescence, or physiological age after the beginning of pubescence, has a very real effect upon both growth and motor performance. The measures of this which we have used here are too crude to determine the exact relationships, and these remain a subject for further study. The findings, however, substantiate the statement of Baldwin (p. 198), at least in so far as they apply to grading children for motor activities. In view of the limited time during which this criterion is available, it is of minor usefulness in studies of anthropometry and physical growth; but at least during the junior and senior high school period, these stages of development should be noted and the facts utilized, especially for classification for physical education activities. These phenomena will have to be combined with others, such as chronological age, height, and weight, if the best use is to be made of them.

ANATOMICAL AGE OR SKELETAL MATURITY

The second method used to ascertain physiological age is to X-ray appropriate parts of the body and compare the state of maturation of the bones with standards compiled from a large number at each chronological age. The methods used vary, as do the parts of the body recommended for study by the X-rays.

The parts of the body X-rayed have been, for most of the studies, the hands and the wrists. Some studies have been made on the feet. In the extensive study conducted by the Brush Inquiry at Western Reserve University at Cleveland under the direction of Dr. T. Wingate Todd, X-rays are taken of hands, wrists, elbow, foot, and knee, taken both antero-posteriorly and laterally, and of shoulder and hip, postero-anteriorly. For almost any practical purpose, however, the postero-anterior X-rays of the hands and wrists will give all essential information.

The reading of maturational age from the X-ray is simple or complex according to the standards used. The most important of these methods are:

1. The appearance of centers: This method is based upon the time of appearance of centers of ossification of the carpal bones and of the epiphyses of hands and wrists. The standards are based upon the average time of such appearance. These are sometimes read in terms of age (10, 11, 12), and sometimes in arbitrary stages (13, 14). This is the method most applicable to newborn infants. The appearance of centers method is limited in usefulness, however, because of gaps that appear between some of the stages.

2. The stages of fusion of epiphyses with their diaphyses (15, 16, 17, 18): This method adds to the information obtained from the time of the appearance of the centers, but also has its limitations. Todd and Francis (19) combined these two methods and have prepared standards based upon: (1) date of appearance of centers for the first five years; (2) stage of fusion of the epiphyses and diaphyses, from ages six to fourteen; and (3) the date of complete fusion, from ages fourteen to eighteen. These standards are very good, but somewhat complicated for the layman to use.

3. Carpal area: The size of the carpal bone ossification areas has been used as one method of assessing the relative maturation of the child (20, 21, 22, 23, 24). The sum of areas of all of the carpal bones has been compared to certain areas in the wrist (25, 26). The areas are measured with a planimeter. This instrument is quite expensive, and the method is very time-consuming, but it is a fairly accurate method of prediction for the younger age groups. It falls down badly at the older age levels.

4. Diameters of the carpal bones (29): These methods have not proved particularly successful.

5. Diameters of carpal bones and widths of certain epiphyses (27, 28): This method is a promising one. The best objective standards as yet developed apply only to boys from age six to age eighteen (30). This is, however, the school age. In this method, the index is determined as follows:

The sum of the greatest diameter of eight carpal bones and the broadest width of the epiphyses of the radius, ulna, and four first metacarpals is divided by the average diameter of the wrist. This is taken to be the average distance at the proximal end of the metacarpals between the most exterior point of the first metacarpal bone and the most exterior point of the fourth metacarpal bone, and the distance at the distal end of the radius and ulna between the most exterior points of the radius and ulna (diaphyses). This index can be measured with very little equipment other than a pair of small calipers—or even a millimeter rule—and requires a minimum of time. Standards for the six- to eighteen-year-old boys have been published by Kelly (30). Standards for the planimeter method were published by Baldwin, Busby and Garside (5), and by Carter (10).

6. Qualitative scales: Probably the most usable and practical devices are found in the recent publications of Flory (21) and of Todd (61). Flory's study, in addition to an excellent review of the literature, presents a qualitative scale for evaluating and "aging" X-rays of the hands and wrists. Average samples for each year of chronological age for each sex are given, covering the ages from birth to nineteen for males, and from birth to seventeen for females. With these standards it is simple, with a little practice, to estimate the maturational age or anatomical age to within six months, and films

can easily be "aged" at the rate of one a minute—which is a speed far greater than can be attained by any of the objective methods. Flory's sampling was entirely of private school children, but without a rigid medical selection. It represents a random sample of children from homes of a considerably advanced socio-economic group. Flory's criteria for judging the plates are not worked out in great detail. It is, however, an excellent and a useful study.

Todd and his co-workers (61) in 1937 published a similar type of qualitative standards on X-rays of the hands and wrists. This study represents the most extensive and far-reaching study as yet made in this field. The plates are in three-month intervals at the lower end, and in six-month intervals at the upper end. Todd has also made a clear presentation of the method of weighting conflicting evidence. The sampling was a highly selective one and will probably give standards that are somewhat too high. Since they are consistent, however, this will prove to be but a minor difficulty.

The use of either of these qualitative scales will give relatively accurate results in a minimum of time.

CHAPTER XI

ANTHROPOMETRY IN THE SERVICE OF THE INDIVIDUAL

In the preceding chapters we have treated the subjects of measurements of body build (Chapter II), of normal weight (Chapter IV), of fat (Chapter V), of muscular development (Chapter VI), of skeletal age (Chapter X), and of breathing capacity (Chapter IX). In addition we have discussed some of the problems that are raised by deviates from the physiologically normal (Chapter VIII). In this chapter we shall consider the relative importance of the various methods proposed, and discuss the relative contributions and their interpretation in the service of the individual.

Here it may be in order to again point out that the anthropometric measurements cannot be substituted for the medical examination. Single, or even multiple, pathologies may have a relatively slight influence on general nutrition. In the case of an individual of relatively low thyroid output, and perhaps with a low secretion of posterior pituitary as well, the tendency to put on fat may overcome quite unfavorable pathological conditions.

On the other hand, pathologies do tend to "pull the individual down," to leave their mark in poorer nutrition and poorer general condition, such as muscular condition, and to reflect themselves often in a lowered breathing capacity. Hence it seemed wise to attempt an evaluation of these methods against a careful medical appraisal.

A careful medical examination was conducted by a physician employed by the Iowa Child Welfare Research Station. He had studied the problem for some time and had made a number of practice ratings of condition. The final rating for this study was made upon ninety-five senior high school boys of the University High School. The rating of the physician was based upon nutritional status, and upon the pathological findings. The scale used gave a positive score for the nutritional status and the pathological findings were subtracted from this.

In the evaluation of this study it should be stated that it was subjective and made without knowledge of the physical measurements. Evaluations of this type have been found (23) to be of relatively low reliability, and the validity seldom exceeds the reliability. The average for fifty-seven intercorrelations between the ratings of physicians on the same children in the Franzen study (23) was found to be .60, while the range of correlations ran from .18 to .82. There is no means of knowing the reliability or the validity of the ratings used in this study, except that in cases in which the rating differed seriously in individual items, objective evidence favored the measurements. The correlations between the medical findings and the objective measurements were universally low, and the usefulness of the study is more for the purpose of determining the relative contribution of each type of measurement than for evaluating them as measurements of condition. The results are seen below

Variable, in Per Cent From Normal	Medical Rating	Total Fats		Breathing Capacity
		Unweighted	Weighted	
Weight	.371	.524	.428	.043
Arm Girth	.350	.516	.327	−.192
Forearm Girth	.279	.242	.137	−.112
Thigh Girth	.270	.506	.553	−.053
Calf Girth	.153	.169	.259	−.033
Average Limb Girth	.330	.463	.415	−.128
Unweighted Total Fats	.378 (.433)*			
Weighted Total Fats	.163			
Breathing Capacity	.291	−.066		

* See text

and the intercorrelations between over- and underweight and the limb girths are seen in the following tabulation.

Variable	Weight	Arm	Forearm	Thigh	Calf
Arm	.461		.522	.522	.299
Forearm		.522		.399	.268
Thigh		.522	.399		.486
Calf		.299	.268	.486	
Average	.687				

From the above tabulation it will be seen that the measurement of over- and underweight is the best of the group of appraisement methods so far as agreeing with medical appraisements is concerned. If we assume that the reliability for the medical examination is about .60 (and this is probably true), and that of the measurements is about .90 (it is at least that), then the true correlation corrected for attenuation is about .51.

The next "best" variable is the girth of the upper arm, which is, in this sample, better than the average of all of the girth measurements. The corrected correlation would be about .48. This would indicate that the upper arm girth may be used alone, without the other limb girths, without loss of predictive value. The unweighted sum of the total fats gave a correlation of .332. When, however, one very corpulent boy was removed from the data, this rose to .433. The "true correlation" would be approximately .59.

Using the uncorrected correlations, and using all of the subjects, a number of partial and multiple correlations were computed. In the first column:

0 = physician's rating
1 = per cent over- and underweight
2 = per cent over and under average limb girth
3 = per cent over and under unweighted total fat
4 = per cent over and under breathing capacity

In the second column the same correlations have been computed but per cent over and under average limb girth has been replaced by per cent over and under upper arm girth. (Correlations in parentheses indicate that there was no limb girth included.)

	Correlation	Correlation
$r_{01.2}$	.211	.252
$r_{01.3}$		(.250)
$r_{02.1}$	.111	.217
$r_{02.3}$	.211	.221
$r_{03.1}$		(.173)
$r_{03.2}$	.214	.188
$r_{13.2}$	.319	.376
$r_{23.1}$	.167	.362
$r_{01.23}$	.154	.200
$r_{02.13}$	.084	.168
$r_{03.12}$	.158	.104
$r_{04.12}$		.368
$r_{04.13}$		.321
$r_{04.23}$		.390
$r_{04.123}$		.372

It will be seen that, in general, the girth of the upper arm is superior to the average girths of all four measurements as an indicator of condition, at least so far as this group is concerned; that, on the whole, weight is a better indicator of nutritional status than either of the other two items studied, and that the arm girth is a close second.

Multiple correlations were also computed for a number of combinations.

	Correlation	Correlation
$R_{0.123}$	.412	.433
$R_{0.12}$	.385	.422
$R_{0.13}$		(.405)
$R_{0.23}$	.387	.392
$R_{0.1234}$		.547
$R_{0.124}$		.538
$R_{0.134}$		(.500)
$R_{0.234}$		.531
$R_{0.24}$		.506

Here again the inclusion of weight norms favorably influences the results, and the inclusion of breathing capacity very decidedly increases the correlation with physician's ratings. $r_{04.123}$ is .372, which is quite a bit higher than the zero order correlation with the rating.

If it is decided to weight these variables to produce the best prediction of physician's ratings, the following sets of proportionate weightings, rounded off from the regression equations, are suggested:

Variable	Possible Weightings						
Per Cent Over- or Underweight	5	1			4	7	1
Per Cent Over or Under Upper Arm Girth	10	2	8	2.5		7	1
Per Cent Over or Under Total Fat (Unweighted)	1		1		1	1	
Per Cent Over or Under Breathing Capacity	6	1	4	1	3		
Multiple Correlation	.547	.538	.531	.506	.500	.433	.422

To obtain the significance of each of these, it would be necessary first to score the group, then to make a distribution of the results, and to assign categorical weightings to the results. Perhaps a T-score technique would be as useful as any other way of grading these results. This has not been done in this study.

If we assume a reliability of .60 for the physician's ratings and .95 for the other variables, the approximate "corrected" multiple correlation for the best combination would be .75. This is not high, but it is probable that the best combination is highly accurate as a predictor of the medical condition of the individual, even though this is not its chief function. There are no data available at the present time to determine how much tests of strength would affect these results.

If we think not of medical ratings, but of relative weight for build as a criterion of nutritional status, then as was shown in the first study (p. 86) of this series, limb girths contribute approximately twice as much to weight as do the fats. In the University High School data analyzed above, the $\beta_{12.3}$ (muscle) $= .566$, and the $\beta_{13.2}$ (fat) $= .263$. This is also approximately two to one. There are no comparable figures as yet for the relative contribution of strength to *nutritional* status, though it is probably highly correlated. The probabilities are that it is more highly correlated with general health and functional efficiency than it is with pure nutritional status in the narrower sense of being properly fed. One may be well fed and have assimilated the food properly and yet be functionally undeveloped and inefficient. It is the efficiency for function—which must include adequate nutrition—that is measured by the tests of strength.

In formulating a program for the measurement of general physical and nutritional status, there is a constant conflict between time available for such measurements, computations, and interpretations, and the completeness of the desired information. To take all of the needed measurements, compute the norms and indices, and interpret them for each individual, is time-consuming. Short-cut methods save much in time, but lose in accuracy of prediction.

Whatever methods are utilized, they cannot be utilized blindly. The measurer must look at the child as well as at the tape. Exceptions to the standards will then become understandable. Norms for prepubescent children judged from fifteen- or sixteen-year-old standards will probably be in error (Chapter X). Children who are past the extremes at either end of the height range must be judged according to their anatomical age—and sometimes subjectively, according to their peculiar glandular make-ups. Such, however, are in the vast minority, and need not take a great amount of time.

If, because of exigencies of time, it is necessary to conduct only a partial program, the successive dropping off of measurements may, in the opinion of the writer, be as follows:

I
Strength
Normal Weight
Breathing Capacity
Fat

II
Normal Weight
Breathing Capacity
Limb Girths
Fat

III
Normal Weight
Breathing Capacity
Upper Arm Girth
Fat

IV
Weight
Breathing Capacity
Fat

V
Upper Arm Girth
Breathing Capacity
Fat

VI
Upper Arm Girth
Breathing Capacity

In any of the above combinations, strength may be substituted for arm or limb girths with profit.

It has been suggested by hygienists that consistent gain in growth is a satisfactory sign of health. In cases where it is impossible to do more than measure height and weight, *gains* in these may be noted. The average gains per year are shown in the following tabulation:

Age,	Height*		Weight*	
Years	Boys	Girls	Boys	Girls
2	10	9	15	18
3	7	7	12	14
4	6	6	11	9
5	5.5	5.5	10	13
6	5	5	12	11
7	5	5	12	12
8	4	4	10	11
9	4	4	12	11
10	3	4	9	13
11	3	5	10	14
12	4	4	13	12
13	4	2	11	11
14	4	0.8	13	6
15	3	0.4	6	1.5
16	2	0.1	7	0.5
17	0.5	0	4	0.5
18	0.5	0	3	0.5

* In terms of per cent per year

Figures for boys rounded off from: Meredith, Howard V.: The Rhythm of Physical Growth: A Study of Eighteen Anthropometric Measurements on Iowa City White Males. Univ. Iowa Stud., Stud. in Child Welfare, 1935, 11, No. 3, Pp. 128.

Figures for girls rounded off from: Boynton, Bernice: The Physical Growth of Girls: A Study of the Rhythm of Physical Growth From Anthropometric Measurements on Girls Between Birth and Eighteen Years. Univ. Iowa Stud., Stud. in Child Welfare, 1936, 12, No. 4, Pp. 105.

Monthly gains may be computed accordingly. This is not a satisfactory method of ascertaining physical status, but is much better than doing nothing about it.

CHAPTER XII

A SCHOOL PROGRAM OF ANTHROPOMETRY

In this discussion of a school program of anthropometry, no account is taken of research programs in this field. We shall discuss only an applied anthropometric service for the purpose of ascertaining the general health, nutritional condition, and physical status.

As has been noted, time is frequently an important element in an anthropometric program in any institution. In many smaller schools, however, and there are more small schools in the United States than there are large ones, the pupil load is not great, and there is no reason why a relatively complete service might not be introduced. In the state of Iowa, for example, more than half of the high schools have less than seventy pupils. It would not place a heavy burden upon any teacher to undertake a complete program of anthropometry in such a school. In schools where there are not more than 250 pupils to be cared for by one teacher, this can also be done without too much sacrifice of time. It is a question whether schools that cannot find the time to render adequate service to the pupils because of heavy pupil loads should not think in terms of a larger staff rather than in terms of a more inefficient service. Hence, we shall propose the relatively complete program and indicate the order in which, in our opinion, certain items should be sacrificed if such sacrifices are necessitated by the situation.

The taking of the measurements, once the techniques have been overlearned, is not a time-consuming task. Hence, even more than the minimum of measurements may easily be taken. We suggest the following measurements, therefore, those in parentheses being optional for use in checking abnormal cases only:

Weight (in kilograms, if feasible)
Standing height
(Sitting height)
Chest girth at xiphoid level
(Chest depth)
(Chest width)
Hip width—bi-cristal
(Hip width—bitrochanteric, without pressure[1])

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[1] Of use only on postpubescent females, and then only in exceptional cases.

Elbow width
Knee width
(Shoulder width—bi-acromial)
Upper arm girth—left
Forearm girth—left
Thigh girth—left
Calf girth—left
Fat—Chest front
Fat—Chest back
Fat—Abdominal
Fat—Supra-iliac
Breathing capacity (cubic inches)
Strength Index
Stage of Pubescence

From this list should be computed, in order:

1. "Corrected" chest girth
2. "Corrected" hip width
3. Normal weight
4. $\frac{\text{Actual weight}}{\text{Normal weight}}$ = Weight Index
5. Total fat
6. $\frac{\text{Actual fat}}{\text{Normal fat}}$ = Fat Index (per cent over or under fat)
7. Normal limb girths (may be limited to upper arm girth)[1]
8. $\frac{\text{Actual limb girths}}{\text{Normal limb girths}}$ = Limb Girth Index[1]
9. $\frac{\text{100 x Strength Index}}{\text{Strength Norm}}$ = Physical Fitness Index
10. Normal breathing capacity
11. $\frac{\text{Actual breathing capacity}}{\text{Normal breathing capacity}}$ = Breathing Capacity Index
12. It is also useful to get the weight for age and height from the Baldwin-Wood tables and divide this into the normal weight obtained above, giving the Index of Build. (See p. 121-122.)

If part of the program must be sacrificed first eliminate limb girths *if the strength index and the physical fitness index are taken.* If strength tests are not given, retain the upper arm girth, and eliminate girths of forearm, thigh, and calf, and all measurements in parentheses. The elimination of anything else from the measurements would involve too great a sacrifice. Take the minimum of measurements, and eliminate the computations where they are obviously not needed, as in individuals obviously possessing an adequate physical development.

Two record blanks are given as samples. The first is the complete blank. If strength tests are not given, eliminate that part of the blank. The second is a shortened form, and represents a minimum of measurements for anything that resembles an adequate program.

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[1] Do not compute if measuring actual strengths.

It is advisable to have the cards for the two sexes printed on cards of different colors. White for males and yellow for females are colors frequently selected. This facilitates filing, and avoids errors and extra recording.

If the cards are to be filed for future use, and if further follow-up measurements are to be made, it is advisable to provide a number of columns for recording the measurements at different times. This will also provide for the accumulation of records on the same individuals for future study. It may be advisable to have comparison records of the child's diseases and general health record kept and filed with the anthropometric records. This might be done by the school nurse.

On the forms shown in this volume it will be noticed that measurements are listed in the order to be taken (using one instrument until all measurements to be taken with it are completed), rather than in the order of use. To make the most commonly used measurements stand out, these are listed in large type. Indices to be computed from the measurements are listed in italics for the guidance of the recorder.

For further research uses, the record of nationality of parents may be added if desired. This is best obtained by recording the birth place and nationality of the four grandparents. Avoid the generic answer to this question of "American" unless all records of grandparents give birthplace as America and no further national origins are obtainable upon questioning. Owing to the anthropological differences found in this group, in addition to national origins, record Jewish where such is the case. Thus, if the child's grandfather is Jewish and of German national origin, record him as German-Jewish. These records will probably not be extensively used in the usual school routine, and need not be taken for the purely routine service program. Once taken, however, they do not need to be repeated. Hence, such a record may well be obtained when the child first enters school and kept with his other records. If future interests in research in this material develop, the data will then be available.

In case of the colored population, recent and as yet unpublished evidence would seem to indicate that there is a real, though not very great difference, not only between the anthropometric proportions of colored and white, but between those of almost pure colored stock and those who are predominantly white with very little colored blood. Hence in recording the race as Negro, it is well, if possible, to indicate as nearly as possible the degree. This is almost impossible to obtain accurately; hence the common practice may very well be to record as "light, medium, or black." While this classification cannot be easily defended anthropologically as an accurate one, it is just as difficult to suggest a better one. Color charts for classifying the skin color are available[1] but such an accurate classification is not of sufficient importance to justify the added time.

The relatively complete examination should, if at all possible, be made yearly. In situations where this is not possible, however, measurements may be made at two-year intervals. At that time the "Percentage Index of Build," according to the formula of normal weight (computed from sex, age, height, chest girth corrected, hip width corrected, and knee width) divided by the weight for sex, age, and height from the Baldwin-Wood tables (metric, for nude weight) should be computed. In the interim between complete measurements the norm from the Baldwin-Wood tables multiplied by the "Percentage Index of Build" may be used as a substitute for normal weight. This procedure is only a make-shift one at best, and while it may be used during the years in which there are no changes in the status of pubescence without too much error, from the onset of puberty until the completion of the pubescent changes, the complete measurements should be made each year. It should also be borne in mind that where slight errors are made in taking the measurements, these will be carried over for the next year if the "Percentage Index of Build" substitute is used. Therefore, it is strongly recommended that the measurements be taken each year.

Breathing capacity should be checked at least twice a year, and the norm computed. For children who are obviously normal in fat and muscular development, no other routine measurements need be made. For all who appear even slightly doubtful, the check on weight and on fat and upper arm girth should also be made semi-annually.

A summary of results should be filed for follow-up purposes, and should follow the child from school to school. When the child leaves school, these cards should be filed in a permanent file and kept for reference for a number of years. These records should be made available to the family physician and other authorized agents.

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[1] For such an instrument see Martin (41).

A suggested form for such a record blank is given on page 110. Much care should be taken to eliminate the possibility of errors of record, which may be such that children in whom important defects have been found are recorded as normal. In anthropometric examinations, this may be due to errors of recording or to errors of computation. To prevent errors of recording, it is the common practice to have the recorder call back the measurement as a check. In cases of doubt, the child can always be remeasured.

To avoid errors of computation, the work should be checked by doing it twice, or by making a careful checking of the figures when the computations are made from the tables. All suspicious indices should be rechecked. If these are reviewed by teachers who know the children, before being sent out to the parents, many errors may be avoided.

THE FOLLOW-UP

A common fault of many school investigations and measurement programs of this kind, including the medical examinations, is a lack of follow-up.

A study by the American Child Health Association (1) has indicated that only about 2 per cent of all defects found in school medical examinations in New York City were ever treated. This is an appalling wastage of human material. It should, therefore, be the task of administrators of the health program of the schools to see that defects and deficiencies discovered should not only be called to the attention of the child's parents, but if the parents do nothing about it, that further efforts at motivation should be made.

On the following page appears a copy of the blank used by the Iowa Child Welfare Research Station for notifying parents of the results of the anthropometric measurements on their children. This form is mimeographed with a wide left margin, and any extraordinary findings are noted there.

For administrative purposes, the school officer to whom responsibility for the follow-up is assigned should keep a file of cases needing such attention. Children with obviously poor nutrition should be checked up as to home conditions, economic conditions, and general diet. This will necessitate a conference with the parents, and in some cases, perhaps, aid from outside sources. Underdeveloped children should be called to the attention of teachers of physical education. It is essential, however, that this "calling attention" is not considered to fulfill the school's obligation. Attention must be given until suitable results are attained.

REPORT TO PARENTS ON PHYSICAL MEASUREMENTS

Child.. Date of measurement
Age when measured..................................
Years Months

Height:.. inches

.... inches is the average height of American-born children of this age and sex. Your child is therefore short, medium, tall. This fact in itself, while of interest, is of no vital significance, as height is largely due to inheritance. If your child is excessively tall or short, it will be so noted on the margin. A study of repeated measurements of many thousand children shows that as a rule tall children remain tall, and short children remain short as they grow older, although there are exceptions. Tall children also tend to mature earlier than short children, and tend to reach their final stature earlier.

Weight:.. pounds, not including clothing.

.... pounds is the average weight, and .... to .... pounds is considered the normal range of weight for children of this age, sex, height, and general build. This build varies from very slender to very stocky, and is determined in this Station from measurements of height, chest, hips, and knee.

Weight Index: The weight index is the per cent overweight or underweight outside the zone of normality according to the average weight for build. An underweight deviation from the average of less than 4 per cent or an overweight deviation of more than 8 per cent is not considered to be significant, as minor functional variations and slight differences in build will frequently account for this much variation. Children more than 6 per cent under the average or more than 15 per cent over the average may be in need of medical attention.

Your child is .... per cent overweight, underweight according to that standard.

Underweight may be directly due to a relative lack of normal fat, or to a relative underdevelopment of the muscles. If your child has been noted as being underweight, the condition of his, her fat and muscle is noted below.

The thickness of the skin and subcutaneous fat is .... per cent below average for a child of this age (if overweight, this is not stated).

The muscular development is .... per cent below average for this age and build (if above the normal, this is not stated).

Breathing capacity: .... cubic inches.

.... cubic inches is the average breathing capacity for this age, height, and weight. If your child has a breathing capacity of less than .... cubic inches, he, she may be in need of special attention.

The information listed above gives a general indication of the physical status of your child at the time the measurements were taken. It should be remembered that actual size is of much less importance than normal growth and development. This normal development for age, size, and type is indicated above in the measurements given and their relationship to the average. By following these measurements in this and subsequent reports, the progress of your child can readily be determined.

If you wish to discuss the significance of the findings in this report, please telephone .... for an appointment.

It is, perhaps, not necessary to state that the measurements discussed in this book do not constitute the entire testing or measuring program in the schools. The measurements discussed in this volume are limited to anthropometric measurements. Medical assessments, tests of posture, and of general motor function are just as important, and should be included in the follow-up program.

In many school systems, the medical examinations go on throughout the year. Often a child may not be reached by the physician before the last month or two of school. The anthropometric program can be completed rather rapidly, and on the basis of its findings children exhibiting major deficiencies can be referred at once to the physicians for careful examination. These children, also, are the ones needing the greatest amount of emphasis in the follow-up.

TRAINING OF MEASURERS

The body landmarks and techniques of measurement used in the above outlined program will be found in Chapter IX of *Appraising Physical Status: The Selection of Measurements* (40). The measurements, to be of value, must be accurately taken. It is of greatest importance that the directions be followed to the letter, and that great care be taken to avoid deviating from the standard techniques suggested. If at all possible, the measurers should be trained by those who are themselves skilled in the measuring. Where this is not possible, no measurer should assume responsibility for a measurement program until he has practiced for at least ten clock hours on techniques, and has, in addition, measured at least twenty subjects twice each to check his accuracy. The two sets of measurements on the same subject should agree very closely.[1]

ADMINISTRATION OF THE MEASUREMENT PROGRAM

If time is not a vital element, it is advisable to schedule each subject separately, and for about fifteen minutes. He can then be measured carefully (with the exception of the strength tests), his norms and indices computed, and the results explained to him if he is old enough to understand what they mean. The strength tests should be given in the gymnasium, usually by the physical education teacher, and can be administered in groups of twenty or twenty-five.

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[1] See Meredith, Howard V.: The reliability of anthropometric measurements taken on eight- and nine-year-old white males. Child Develop., 1936, 7, 226-272.

Where time is important, as it is in many understaffed large schools, the anthropometric measurements may be divided into two groups. Height, sitting height, weight, and breathing capacity may be taken by a trained assistant. This may be any intelligent, careful pupil, but he must be trained until his accuracy of measurement is beyond question. Since these are easy measurements to take, however, this training will not take very long.

The examiner himself should do all other measurements. After skill in measuring has been attained, subjects may be measured at the rate of about eighteen an hour by this team, provided each measurer has a recorder. The measuring will be facilitated if two other student assistants are detailed to contact the rooms from which the pupils come and to supervise the dressing and undressing.

Boys may usually be measured nude. Girls may be measured nude, or they may wear shorts and a brassiere. Any subjects objecting strenuously to such disrobing may be measured at another time, and covered with a poncho-like sheet.

Perhaps a final statement is in order. It should be remembered that the anthropometric measurement program and the medical examination program only partially serve the same purpose. Neither can entirely take the place of the other. Certain pathological conditions will be found by the medical examination that have not as yet effected changes in the anthropometric status of the individual. On the other hand, the anthropometric findings will often point to incipient pathological changes that are not as yet so readily discernible as to be found in the usual routine school medical examination, or even in a more thorough examination. Hence, both types of examinations should be used. Students whose physical or nutritional status is the poorest should be given the preference over other more normal children in referring them to the school or family physician. All cases found to need medical attention should be followed up until adequate attention to the condition has been given. Only then will either anthropometric or medical examinations attain their goals of service to the individual.

ANTHROPOMETRIC MEASUREMENTS

Name Address

School Grade School

Birth Date Sex Race

Date of measurement				
Age: Years, months, days				
HEIGHT STANDING				
Height sitting				
Width of shoulders				
Depth of Chest				
Width of chest				
WIDTH OF HIPS: BICRISTAL	[1]	[1]	[1]	[1]
Width of hips: bitrochanteric, no pressure				
WIDTH OF ELBOW				
WIDTH OF KNEE				
GIRTH OF CHEST	[1]	[1]	[1]	[1]
GIRTH OF UPPER ARM	[2]	[2]	[2]	[2]
GIRTH OF FOREARM	[2]	[2]	[2]	[2]
GIRTH OF THIGH	[2]	[2]	[2]	[2]
GIRTH OF CALF	[2]	[2]	[2]	[2]
FAT: CHEST FRONT				
FAT: CHEST BACK				
FAT: ABDOMEN				
FAT: SUPRA-ILIAC				
Total fat				
Hip difference				
WEIGHT				
BREATHING CAPACITY				
Pubescence				
STRENGTH TESTS*				
RIGHT GRIP				
LEFT GRIP				
BACK LIFT	[3]	[3]	[3]	[3]
LEG LIFT	[3]	[3]	[3]	[3]
PULL-UPS	[4]	[4]	[4]	[4]
PUSH-UPS				
TOTAL STRENGTH				
Weight Index				
Limb-girth Index#				
Fat Index				
Breathing Capacity Index				
Physical Fitness Index				
Index of Build				

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[1] Indicates correction of measurement made for fat

[2] Indicates NORMAL measurement

[3] Indicates strength computed from number of pull-ups or push-ups and weight

[4] Indicates strength norm

* If strength tests are used, the limb girths may be omitted.

Percentage of upper arm girth may be substituted for this.

ANTHROPOMETRIC MEASUREMENTS

Name
Address
School Grade
School
Birth Date
Sex
Race

Date of measurement				
Age: Years, months, days				
HEIGHT STANDING				
WIDTH OF HIPS: BICRISTAL				
WIDTH OF ELBOW				
WIDTH OF KNEE				
GIRTH OF CHEST	[1]	[1]	[1]	[1]
GIRTH OF UPPER ARM	[2]	[2]	[2]	[2]
FAT—CHEST FRONT				
FAT—ABDOMEN				
FAT—SUPRA-ILIAC				
FAT—CHEST BACK				
Total Fat	[2]	[2]	[2]	[2]
WEIGHT	[2]	[2]	[2]	[2]
BREATHING CAPACITY	[2]	[2]	[2]	[2]
Pubescence				
Weight Index				
Upper Arm Girth Index				
Fat Index				
Breathing Capacity Index				
Physical Fitness Index				
Index of Build				

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[1] Indicates correction of measurement made for fat
[2] Indicates NORMAL measurement

ANTHROPOMETRIC RECORD SUMMARY CARD

Name
Address
Sex
Race

School Grade									
Age									
Index of Build									
Weight Index									
Fat Index									
Limb Girth Index									
Physical Fitness Index									
Breathing Capacity Index									

Note: If any measurements have been omitted because the child was obviously fit, check with the symbol X. If omitted for any other reasons, indicate with the symbol —.

If the Weight Index was computed from the Baldwin-Wood charts and the Index of Build, underscore to so indicate.

If the Limb Girth Index was computed from arm girth alone, underscore to so indicate.

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APPENDIX

# WEIGHT - HEIGHT - AGE STANDARDS (Nude) IN METRIC UNITS
for
American-Born Boys of School Age

Height Cm.	Age, Years														Height Cm.
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
	Weight Kg.														
97	15.0*														97
98	15.1*														98
99	15.3*														99
100	15.5*														100
101	15.7*														101
102	15.9*														102
103	16.1*														103
104	16.6														104
105	16.8	16.8*													105
106	17.0	17.0*													106
107	17.2	17.2*	17.2*												107
108	17.5	17.6*	17.4*												108
109	17.8	17.9*	17.7*												109
110	18.3	18.4*	18.2*												110
111	18.9	18.9*	18.8*												111
112	19.4	19.4	19.4*												112
113	19.7	19.7	19.7*												113
114	20.0	20.0	20.0*												114
115	20.4	20.4	20.4*	20.3*											115
116	20.7	20.8	20.7	20.6*											116
117	21.1	21.2	21.1	21.2*											117
118	21.5	21.5	21.4	21.4*											118
119	21.9	21.9	21.8	21.7*											119
120	22.3	22.4	22.2	22.2*	22.2*										120
121	22.5	22.8	22.7	22.7*	22.7*										121
122	22.9	23.2	23.1	23.2	23.2*										122
123	23.4	23.5	23.6	23.6	23.5*										123
124	23.9	23.8	24.1	24.0	23.8*										124
125	24.3	24.3	24.5	24.4	24.2	24.4*									125
126	24.6*	24.9	24.9	24.9	24.8	24.9*									126
127	25.0*	25.3	25.3	25.3	25.4	25.4*	25.4*								127
128		25.9	25.9	25.7	25.9	25.9*	25.9*								128
129		26.4	26.5	26.2	26.4	26.4*	26.4*								129
130		26.9	27.0	26.7	26.8	27.0	26.9*								130
131		27.2	27.4	27.3	27.3	27.5	27.3*								131
132		27.5	27.9	27.8	27.8	28.0	27.7								132
133		28.0*	28.4	28.4	28.3	28.5	28.3	28.5*							133
134		28.5*	28.9	28.9	28.8	28.9	29.0	29.3*							134
135			29.4	29.4	29.3	29.4	29.6	29.9*							135
136			30.0	29.9	29.7	29.8	30.3	30.3*							136
137			30.6	30.4	30.2	30.2	30.9	30.7*							137
138			30.9*	30.8	30.9	30.8	31.3	31.2	31.7*						138
139			31.2*	31.1	31.5	31.5	31.9	31.8	32.0*						139
140			31.6*	31.6	32.2	32.2	32.4	32.4	32.5*						140
141			32.1*	32.3	32.9	32.8	32.9	33.2	33.1*						141
142			32.6*	33.1	33.7	33.5	33.4	34.0	33.7*						142
143				33.6*	34.1	34.2	34.1	34.7	34.5	35.3*					143
144				34.1*	34.4	35.0	34.7	35.2	35.5	35.8*					144
145				34.6*	34.9	35.7	35.4	35.8	36.3	36.3*					145
146				35.3*	35.7	36.2	36.2	36.5	36.9	37.0*					146
147				36.0*	36.5	36.7	36.9	37.1	37.4	37.7*					147
148					37.0	37.2	37.6	37.8	38.0	38.2					148
149					37.5	37.8	38.2	38.4	38.6	38.7					149
150					38.1	38.5	39.0	39.1	39.3	39.3	39.2				150
151					38.7*	39.2	39.5	39.7	40.0	40.3	40.3				151
152					39.4*	39.9	40.0	40.3	40.7	41.3	41.5				152
153						40.5	40.6	41.1	41.6	42.1	42.6				153
154						41.0	41.4	41.9	42.5	42.8	43.7				154
155						41.5	42.1	42.7	43.4	43.5	44.8	46.3*			155
156						42.3*	42.9	43.4	44.0	44.2	45.5	47.2*			156
157						43.2*	43.8	44.1	44.7	44.9	46.3	48.1			157
158						44.0*	44.6	44.9	45.5	45.8	47.3	49.2	51.3*		158
159						44.9*	45.4	45.8	46.4	46.9	48.6	50.3	52.6*		159
160						45.8*	46.2	46.7	47.4	48.0	49.8	51.5	53.9	55.4*	160
161							47.4	47.3	48.1	48.8	50.2	52.0	54.4	55.9*	161
162							48.7	48.0	48.8	49.6	50.6	52.5	54.9	56.4*	162
163							49.4	48.8	49.6	50.5	51.2	53.2	55.5	57.0*	163
164							49.6*	49.9	50.5	51.4	52.1	54.1	56.3	57.7*	164
165							49.7*	50.9	51.4	52.3	53.1	55.1	57.1	58.3	165
166								51.4	52.1	53.2	54.1	56.1	57.9	59.3	166
167								51.8	52.9	54.0	55.1	57.0	58.7	60.3	167
168								52.3	53.7	54.8	56.1	57.8	59.4	61.0	168
169								53.1*	54.7	55.7	57.1	58.5	60.0	61.4	169
170								53.9*	55.6	56.5	58.1	59.1	60.5	61.7	170
171									56.7	57.3	58.8	59.9	61.2	62.5	171
172									57.8	58.0	58.5	60.9	62.0	63.4	172
173									58.7	58.7	60.2	61.8	62.8	64.2	173
174									59.2	59.6	61.1	62.7	63.8	65.1	174
175									59.7	60.4	61.9	63.5	64.7	65.9	175
176									60.5	61.2	62.5	64.0	65.3	66.5	176
177									61.4	62.0	62.9	64.3	65.7	67.2	177
178									62.4	62.8	63.4	64.7	66.1	67.8	178
179									63.3*	63.9	64.5	65.4	66.6	68.4	179
180									64.2*	65.1	65.7	66.1	67.1	68.8	180
181										65.8	66.4	66.7	67.7	69.6	181
182										66.3	67.0	67.3	68.3	70.4	182
183										66.9	67.6	68.0	69.0	71.2	183
184										67.5*	68.6	69.1	70.1	71.8	184
185										68.2*	69.5	70.3	71.3	72.5	185
186										68.8*	70.3	71.3	72.2	73.2	186
187										69.3*	71.0	72.3	73.1	73.8	187
188										69.8*	71.7	73.3	73.9	74.4	188

*The starred figures represent values based upon theoretical computations, rather than on exact averages.

Age is taken at the nearest birthday; for example, a boy is considered 6 years old between 5 years, 6 months and 6 years, 5 months, and 29 days. Height is taken at the nearest centimeter, weight at the nearest tenth of a kilogram.

These tables have been translated and extended from the Baldwin-Wood tables in the English system of measurement by B. T. Baldwin, Ph. D.

Issued by the Iowa Child Welfare Research Station, State University of Iowa, Iowa City, Iowa, September, 1924.

# WEIGHT - HEIGHT - AGE STANDARDS (Nude) IN METRIC UNITS
for
American-Born Girls of School Age

Height Cm.	Age, Years 6	7	8	9	10	11	12	13	14	15	16	17	18	Height Cm.
	Weight Kg.													
97														97
98														98
99														99
100	15.3													100
101	15.7													101
102	16.0	16.0*												102
103	16.1	16.1*												103
104	16.3	16.3*												104
105	16.6	16.6*												105
106	16.8	16.8*												106
107	17.1	17.1												107
108	17.6	17.5												108
109	18.0	17.8												109
110	18.2	18.1	18.2*											110
111	18.4	18.5	18.4*											111
112	18.6	18.8	18.6*											112
113	19.2	19.3	19.1*											113
114	19.7	19.8	19.7*											114
115	20.2	20.1	20.2											115
116	20.6	20.3	20.8											116
117	21.0	20.5	21.3	21.2*	21.2*									117
118	21.4	21.1	21.5	21.5*	21.5*									118
119	21.8	21.8	21.8	21.9*	21.9*									119
120	22.3	22.3	22.2	22.3*	22.3*									120
121	22.7	22.7	22.7	22.7*	22.9*									121
122	23.1	23.1	23.1	23.2	23.4	23.4*								122
123	23.3	23.4	23.5	23.6	23.8	23.7*								123
124	23.4	23.7	23.8	24.2	24.1	24.0*								124
125	23.7	24.1	24.3	24.7	24.6	24.7*								125
126	24.2*	24.4	24.8	25.2	25.3	25.8*								126
127	24.7*	24.8	25.4	25.8	26.0	26.9	27.3*							127
128		25.2	25.8	26.2	26.4	27.2	27.1*							128
129		25.7	26.2	26.6	26.7	27.5	26.9							129
130		26.3*	26.7	27.0	27.1	27.9	27.3							130
131		27.1*	27.4	27.5	27.7	28.2	28.4							131
132		27.8*	28.1	28.0	28.2	28.6	29.5							132
133		28.4*	28.5	28.6	28.8	29.1	29.9							133
134		28.9*	29.1	29.2	29.5	29.6	30.3							134
135			29.6	29.8	30.1	30.1	30.7	31.5*						135
136			30.0	30.4	30.5	30.7	31.0	31.9*						136
137			30.4	31.0	31.0	31.3	31.4	32.2*						137
138			30.9*	31.6	31.6	31.9	32.0	32.8*						138
139			31.4*	32.3	32.3	32.5	32.6	33.4*						139
140				32.9	32.9	33.1	33.2	34.1	34.8*					140
141				33.3	33.6	33.7	34.0	34.9	35.6*					141
142				33.6	34.4	34.3	34.8	35.8	36.5*					142
143				34.2*	35.1	35.0	35.5	36.3	37.4*					143
144				34.9*	35.9	35.6	36.0	36.7	38.4*					144
145					36.6	36.4	36.6	37.2	39.3	41.1*				145
146					36.8	37.3	37.3	38.0	40.3	42.0*				146
147					37.1	38.2	37.9	38.8	41.4	42.8*				147
148					37.6	38.9	38.6	39.5	42.0	43.5*	45.1*			148
149					38.2	39.5	39.2	40.3	42.5	44.0*	45.5*			149
150					38.8	40.2	39.9	41.1	43.0	44.6	45.9*	46.4*		150
151					39.5*	41.0	40.8	41.9	43.8	45.5	46.8*	47.3*		151
152					40.2*	41.8	41.7	42.7	44.6	46.4	47.7*	48.1		152
153						42.6	42.7	43.5	45.4	47.1	48.6	48.9	49.9*	153
154						43.4	43.8	44.2	46.2	47.6	49.4	49.7	50.7*	154
155						44.2	44.8	45.0	47.0	48.1	50.2	50.4	51.4	155
156						44.1*	45.5	45.7	47.5	48.9	50.7	51.1	51.7	156
157						44.0*	46.2	46.5	48.1	49.8	51.1	51.8	52.0	157
158							47.0	47.4	48.7	50.5	51.4	52.2	52.4	158
159							47.9	48.3	49.2	51.0	51.7	52.5	52.7	159
160							48.9	49.2	49.8	51.5	51.9	52.8	53.1	160
161							49.6*	49.9	50.7	52.1	52.6	53.3	53.6	161
162							50.3*	50.6	51.5	52.7	53.2	53.7	54.0	162
163							51.0*	51.4	52.3	53.3	53.8	54.2	54.6	163
164							51.7*	52.2	53.2	53.7	54.3	54.8	55.3	164
165							52.4*	53.1	54.0	54.2	54.8	55.4	55.9	165
166								54.0	54.5	54.6	55.7	56.1	56.6	166
167								54.9	54.9	55.0	56.6	56.9	57.4	167
168								55.6*	55.5	55.7	57.4	57.6	58.2	168
169								56.2*	56.6	56.9	58.2	58.2	59.2	169
170								56.8*	57.6	58.0	58.9	58.9	60.1	170
171								57.3*	58.2	58.8	59.5	59.7	60.7	171
172								57.8*	58.7	59.5	60.0	60.7	61.1	172
173									59.1	60.1	60.5	61.4	61.6	173
174									59.6*	60.5*	60.9*	61.8*	62.3*	174
175									60.0*	60.8*	61.2*	62.1*	62.9*	175
176									60.2*	61.0*	61.6*	62.5*	63.4*	176
177									60.4*	61.2*	62.0*	62.8*	63.7*	177
178									60.6*	61.5*	62.4*	63.2*	64.0*	178
179									60.9*	61.8*	62.7*	63.5*	64.2*	179
180									61.3*	62.2*	63.0*	63.9*	64.4*	180

*The starred figures represent values based upon theoretical computations, rather than on exact averages.

Age is taken at the nearest birthday; for example, a girl is considered 6 years old between 5 years, 6 months and 6 years, 5 months, and 29 days. Height is taken at the nearest centimeter, weight at the nearest tenth of a kilogram.

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Appendix to Chapter X

THE COMPUTATION OF THE TRISERIAL CORRELATION COEFFICIENT

Where there is some reasonable degree of assurance that a qualitative trait (such as pubescence) is distributed normally within a given age range, correlations between this trait and a variable may be computed. This has been done with a two category qualitative trait by the method of biserial correlation, and this method has been extended to three categories in this study. The method of computation is as follows:

Tabulate the figures for each stage of pubescence (prepubescence, pubescence, and postpubescence) in three columns using the same class intervals in each column, much as a product-moment scattergram is plotted. Sum these columns, and sum all rows. Let us call these three columns 1, 2, and 3 respectively, and the frequencies given by the sum of the rows the "frequencies of Y."

Compute the mean (M_0) and the standard deviation (σ_0) of the Y frequencies, and the means of columns 1, 2, and 3 (M_1, M_2, and M_3). Substract the mean of the Y distribution from the mean of each column, and divide these results by σ_0

$$\left(\frac{M_1 - M_0}{\sigma_0}, \quad \frac{M_2 - M_0}{\sigma_0}, \quad \frac{M_3 - M_0}{\sigma_0}\right).$$

The results will be the means of the columns in terms of deviations from the mean of the whole distribution. Let us call these $\overline{y}_1$, $\overline{y}_2$, and $\overline{y}_3$.

Compute the centroid of each category of pubescence. This is done as follows: Assume that this trait has a unit normal distribution. Compute the proportion of all the scores in each segment. These will be $\frac{f_1}{N}$, $\frac{f_2}{N}$, $\frac{f_3}{N} = p_1$, p_2, and p_3 respectively. Then find the height of the ordinate between each of the categories, from the Kelly-Wood tables (29) or from Table 1 of Pearson's tables (45). The Z's in these tables are found from the P's of each category, cumulating them as you go. The centroid will be:

For column 1: $\frac{-Z_1}{P_1}$

For column 2: $\frac{Z_1 - Z_2}{P_2}$

For column 3: $\frac{Z_2}{P_3}$

Call these values $\overline{x_1}$, $\overline{x_2}$, and $\overline{x_3}$ respectively.

Since $b_{12} = r_{12}\frac{\sigma_1}{\sigma_2}$, and since in this case σ_1, and σ_2 each equals 1, r_{12} will equal b_{12}, or the slope of the best fitting straight line through these points, $\overline{X}_1\overline{Y}_1$, $\overline{X}_2\overline{Y}_2$, and $\overline{X}_3\overline{Y}_3$. This b_{12} (which equals r_{12}) may be obtained by fitting this line by least squares. The equations for this are:

$$\Sigma p\overline{y} = b\Sigma p\overline{x}$$
$$\Sigma p\overline{xy} = b\Sigma p\overline{x^2}$$

Summing, $\Sigma\overline{py} + \Sigma p\overline{xy} = b(\Sigma p\overline{x} + \Sigma p\overline{x^2})$.

But $\Sigma p\overline{y}$ and $\Sigma p\overline{x}$ each equal 0, hence

$$b = \frac{\Sigma p\overline{xy}}{\Sigma p\overline{x^2}} = r_{\text{triserial}}$$

DIRECTIONS FOR USING TABLES

T-SCORE TABLES

The use of the T-score tables may be illustrated from Table 1. First compute the value of the index by dividing the cube root of the (normal) weight by the standing height. This may be done very rapidly using the "K" scale on any polyphase slide rule. If the age is 10 and the resulting index is .0191, this would give a T-score of 15, or 3.5 standard deviations below the average. If the age is 14 and the index is .0242, the T-score would be 70, or two standard deviations above the mean for that age.

"CORRECTING" THE CHEST GIRTH FOR FAT DEVIATIONS FROM NORMAL

In column one of Table 20 the male norms are given and in column two, the female norms. Find the difference between the actual measurements and the norm. Column four gives the correction to be made according to the deviations found in column three. If the actual sum of the fat measurements is under the norm, add the correction; if over the norm, subtract the correction.

Illustration: A fourteen-year-old boy has a chest front measurement of 10 and a chest back of 12, or a total of 22. The norm shown for fourteen-year-old males is 29. The deviation is, therefore, 7, and opposite the 7 in the third column will be found the correction of 1.1 cms. in the fourth column. Since his actual measurements were less than the norm, this correction should be added to the chest circumference.

“CORRECTING” THE HIP WIDTH FOR FAT DEVIATIONS FROM NORMAL

In column one of Table 21 the female norms are given and in column two, the male norms. Find the difference between the actual measurement and the norm. Column four gives the correction to be made according to the deviations found in column three. If the actual fat measurement is greater than the norm, subtract the correction from the hip width; if the actual fat measurement is less than the norm, add the correction.

Illustration: An eleven-year-old girl has a supra-iliac fat measurement of 27. The norm for this age is 22. The difference is 5, and in column four is found the correction of .4 cm. Since the actual measurement was greater than the norm, this correction is subtracted from the hip width.

WEIGHT PREDICTION TABLES

In computing normal weight from the following tables, always use the “corrected” chest circumference and hip width (See Tables 20 and 21). Since the regression equation for the prediction of normal weight involves four variables, it is necessary to use two tables to compute the normal weight for any one age group. The first table in each pair uses the height and “corrected” hip width and the second table uses “corrected” chest girth and knee width. The intervals used differ from table to table, and interpolation tables are provided to facilitate computation when the values do not coincide with those given in the table.

Illustration: Using the tables for four-year-old boys and the following measurements:

Height	110.2
Hip width	18.9
Chest girth	54.2
Knee width	7.2

In Table 22 in the column at the left we find a height of 110, and in the hip widths listed across the top we find a hip width of 18.8. Where this row and this column intersect, we find the value 13.53. Turning to the interpolation table, we find the value of height for .2 and hips for .1 to be .06, which is added to 13.53, giving a value of 13.59 for the first table.

In Table 23 in the column at the left we find a chest girth of 54, and across the top we find a knee width of 7.2. Where this row and this column intersect we find the value 5.32. Turning to the interpolation table, we find the value of chest girth for .2 and knee width 0 to be .05. Adding this to 5.32 we have 5.37.

Adding the values from the two tables we have: 13.59 + 5.37 = 18.96 kilograms, the normal weight of the child.

TABLES FOR THE PREDICTION OF NORMAL LIMB GIRTHS

In computing normal limb girths from the following tables, always use the measured chest circumference, *not* “corrected” for fat. Two tables are presented for each age and sex, the first predicting upper arm and forearm girth from uncorrected chest circumference and elbow width, and the second predicting thigh and calf girth from uncorrected chest circumference and knee width.

Illustration: Using Table 82 and the following measurements:

Chest circumference	54.7
Elbow width	4.7

In Table 82 in the column at the left we find a chest girth of 54.5, and across the top we find an elbow width of 4.7. Where this row and this column intersect we find a value of 16.55 for upper arm and 16.77 for forearm. Turning to the interpolation tables we find the value for .2 chest girth and 0 elbow width to be .017 for upper arm and .020 for forearm. Adding these to the values found in the main table we have 16.55 + .017 = 16.57 for upper arm and 16.77 + .020 = 16.79 for forearm. In the same way we may use Table 83 to predict thigh and calf girth.

TABLE OF NORMAL FAT MEASUREMENTS

The norms for fat measurements are found in Table 140. To use this table first sum the actual fat measurements for chest-front, chest-back, abdomen, and supra-iliac. Find the difference between this sum and the norm given for total fat. With due regard for sign, divide this difference by the difference given between the mean and the minimum. This quotient multiplied by 100 gives the percentage above or below the norm.

If for any reason it is desirable to analyze these measurements for different parts of the torso, the same process may be repeated with each measurement, and with hip difference as well for girls.

Illustration: For a fifteen-year-old girl:

Measurement	I Actual	II Norm	III Difference I-II	IV Norm-Minimum	V Percentage $\frac{100\text{xIII}}{\text{IV}}$
Chest front	15	17	− 2	6	−33
Chest back	16	19	− 3	6	−50
Abdominal	18	21	− 3	8	−38
Supra-iliac	23	25	− 2	11	−18
SUM	72	82	−10	31	−32
Hip difference	72	50	+22	24	+92

In most cases only the row headed SUM would be computed, but for purposes of illustration all measurements are shown. In this case the girl is somewhat atypical, as she is 32 per cent under the norm of fat for total measurements, but the fat over the trochanter as measured by “hip difference” is 92 per cent more than the average.

STRENGTH TEST TABLES

In computing the Strength Index or actual strength the following tests are given: Right grip, left grip, back lift, leg lift, chinning, and dipping. Before these are summed, the number of chins and dips must be converted into chinning and dipping strength. For boys this is done from Table 141, for girls from Tables 146 and 147.

Illustration: For an eleven-year-old boy weighing 122 pounds who chinned 12 times and dipped 8 times.

In the top half of the table we find the value for 122 pounds. In the left hand column we find 120, and across the top we find 2. Where this row and this column intersect we find the value for weight of 169.9. In the lower part of the table we find the value for 12 chins. In the left hand column we find 10 and across the top we find 2. Where this row and this column intersect we find the value for chins to be 41.0. Adding, 169.9 + 41.0 = 210.9 or 211, the chinning strength. In the same manner dipping strength is computed from the same table for boys. For girls Table 146 is used to compute chinning strength, and 147 to compute dipping strength.

The chinning and dipping strengths are then summed with the right grip, left grip, back lift, and leg lift to give the Strength Index.

The strength test norms are found in Table 142 for boys and Table 148 for girls. The Strength Index x 100 divided by the norm gives the Physical Fitness Index in terms of per cent of the norm.

Illustration: For an eleven-year-old boy:

Age	11
Weight	122
Right grip	92
Left grip	90
Back lift	305
Leg lift	590
Chins	12
Dips	8

Converting the number of chins and dips into chinning and dipping strength we have chinning strength = 211 and dipping strength = 201. Adding these to the right and left grips and the back lift and leg lift, we have: 92 + 90 + 305 + 590 + 211 + 201 = 1489, the Strength Index.

In Table 142 we find the norm for an eleven-year-old boy weighing 122 pounds to be 1367. Multiplying the actual strength by 100 and dividing by the norm we have $\frac{100 \times 1489}{1367} = 109$ per cent, the Physical Fitness Index.

In Tables 143 to 145 and 148 norms are shown for certain variations of the strength test. These are used in the same manner as shown in the illustration.

Table 20

Norms for Correction of Chest Girths

Age	Norm		Deviation	Correction
	Male	Female		
29		49	1	.1
28		48	2	.3
27		48	3	.5
26	41	48	4	.6
25	40	47	5	.8
24	39	46	6	.9
23	39	44	7	1.1
22	38	44	8	1.3
21	36	44	9	1.4
20	35	44	10	1.6
19	34	44	11	1.7
18	34	43	12	1.9
17	33	41	13	2.0
16	31	39	14	2.2
15	29	37	15	2.4
14	29	35	16	2.5
13	28	34	17	2.7
12	27	33	18	2.8
11	27	32	19	3.0
10	27	31	20	3.1
9	27	30	21	3.3
8	26	30	22	3.5
7	26	28	23	3.6
6	26	27	24	3.8
5	26	27	25	3.9
4	25	27	26	4.1
3	28	28	27	4.2
			28	4.4
			29	4.6
			30	4.7

The norm is for the sum of "Chest Front" and "Chest Back" fat measurements.

Table 21

Norms for Correction of Hip Widths

Age	Norm		Deviation	Correction
	Girls	Boys		
4	17	15	1	.1
5	17	15	2	.2
6	17	15	3	.2
7	18	15	4	.3
8	20	16	5	.4
9	21	16	6	.5
10	21	17	7	.6
11	22	17	8	.7
12	22	17	9	.8
13	23	17	10	.9
14	23	17	11	1.0
15	25	17	12	1.1
16	25	17	13	1.1
17	26	17	14	1.2
18	26	18	15	1.3
			16	1.4
			17	1.5
			18	1.6
			19	1.7
			20	1.8
			21	1.9
			22	1.9
			23	2.0
			24	2.1
			25	2.2
			26	2.3

Table 22

Predicting Weight (Kilograms) of Boys, Age Four Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																							
	16.2	16,4	16.6	16.8	17.0	17.2	17.4	17.6	17.8	18.0	18.2	18.4	18.6	18.8	19.0	19.2	19.4	19.6	19.8	20.0	20.2	20.4	20.6	20.8
117	13.65	13.71	13.78	13.84	13.90	13.96	14.02	14.08	14.15	14.21	14.27	14.33	14.39	14.45	14.52	14.58	14.64	14.70	14.76	14.82	14.89	14.95	15.01	15.07
116	13.52	13.58	13.64	13.71	13.77	13.83	13.89	13.95	14.01	14.08	14.14	14.20	14.26	14.32	14.38	14.45	14.51	14.57	14.63	14.69	14.75	14.82	14.88	14.94
115	13.39	13.45	13.51	13.57	13.64	13.70	13.76	13.82	13.88	13.94	14.01	14.07	14.13	14.19	14.25	14.31	14.38	14.44	14.50	14.56	14.62	14.68	14.75	14.81
114	13.26	13.32	13.38	13.44	13.51	13.57	13.63	13.69	13.75	13.81	13.87	13.94	14.00	14.06	14.12	14.18	14.24	14.31	14.37	14.43	14.49	14.55	14.61	14.68
113	13.13	13.19	13.25	13.31	13.37	13.44	13.50	13.56	13.62	13.68	13.74	13.81	13.87	13.93	13.99	14.05	14.11	14.17	14.24	14.30	14.36	14.42	14.48	14.54
112	13.00	13.06	13.12	13.18	13.24	13.30	13.37	13.43	13.49	13.55	13.61	13.67	13.74	13.80	13.86	13.92	13.98	14.04	14.11	14.17	14.23	14.29	14.35	14.41
111	12.86	12.93	12.99	13.05	13.11	13.17	13.23	13.30	13.36	13.42	13.48	13.54	13.60	13.67	13.73	13.79	13.85	13.91	13.97	14.04	14.10	14.16	14.22	14.28
110	12.73	12.79	12.86	12.92	12.98	13.04	13.10	13.16	13.23	13.29	13.35	13.41	13.47	13.53	13.60	13.66	13.72	13.78	13.84	13.90	13.97	14.03	14.09	14.15
109	12.60	12.66	12.72	12.79	12.85	12.91	12.97	13.03	13.09	13.16	13.22	13.28	13.34	13.40	13.46	13.53	13.59	13.65	13.71	13.77	13.83	13.90	13.96	14.02
108	12.47	12.53	12.59	12.65	12.72	12.78	12.84	12.90	12.96	13.02	13.09	13.15	13.21	13.27	13.33	13.39	13.46	13.52	13.58	13.64	13.70	13.76	13.83	13.89
107	12.34	12.40	12.46	12.52	12.58	12.65	12.71	12.77	12.83	12.89	12.95	13.02	13.08	13.14	13.20	13.26	13.32	13.39	13.45	13.51	13.57	13.63	13.69	13.96
106	12.21	12.27	12.33	12.39	12.45	12.51	12.58	12.64	12.70	12.76	12.82	12.88	12.95	13.01	13.07	13.13	13.19	13.25	13.32	13.38	13.44	13.50	13.56	13.62
105	12.08	12.14	12.20	12.26	12.32	12.38	12.44	12.51	12.57	12.63	12.69	12.75	12.81	12.88	12.94	13.00	13.06	13.12	13.18	13.25	13.31	13.37	13.43	13.49
104	11.94	12.01	12.07	12.13	12.19	12.25	12.31	12.38	12.44	12.50	12.56	12.62	12.68	12.74	12.81	12.87	12.93	12.99	13.05	13.11	13.18	13.24	13.30	13.36
103	11.81	11.87	11.94	12.00	12.06	12.12	12.18	12.24	12.31	12.37	12.43	12.49	12.55	12.61	12.68	12.74	12.80	12.86	12.92	12.98	13.04	13.11	13.17	13.23
102	11.68	11.74	11.80	11.87	11.93	11.99	12.05	12.11	12.17	12.24	12.30	12.36	12.42	12.48	12.54	12.61	12.67	12.73	12.79	12.85	12.91	12.98	13.04	13.10
101	11.55	11.61	11.67	11.73	11.80	11.86	11.92	11.98	12.04	12.10	12.17	12.23	12.29	12.35	12.41	12.47	12.54	12.60	12.66	12.72	12.78	12.85	12.91	12.97
100	11.42	11.48	11.54	11.60	11.66	11.73	11.79	11.85	11.91	11.97	12.03	12.10	12.16	12.22	12.28	12.34	12.40	12.47	12.53	12.59	12.65	12.71	12.77	12.84
99	11.29	11.35	11.41	11.47	11.53	11.59	11.66	11.72	11.78	11.84	11.90	11.96	12.03	12.09	12.15	12.21	12.27	12.33	12.40	12.46	12.52	12.58	12.64	12.70
98	11.15	11.22	11.28	11.34	11.40	11.46	11.52	11.59	11.65	11.71	11.77	11.83	11.89	11.96	12.02	12.08	12.14	12.20	12.26	12.33	12.39	12.45	12.51	12.57
97	11.02	11.08	11.15	11.21	11.27	11.33	11.39	11.45	11.52	11.58	11.64	11.70	11.76	11.82	11.89	11.95	12.01	12.07	12.13	12.19	12.26	12.32	12.38	12.44
96	10.89	10.95	11.01	11.08	11.14	11.20	11.26	11.32	11.38	11.45	11.51	11.57	11.63	11.69	11.75	11.82	11.88	11.94	12.00	12.06	12.12	12.19	12.25	12.31

Interpolation Table

Height	Hips	
	0	.1
0	0	.03
.1	.01	.04
.2	.03	.06
.3	.04	.07
.4	.05	.08
.5	.07	.10
.6	.08	.11
.7	.09	.12
.8	.10	.14
.9	.12	.15

Table 23

Predicting Weight (Kilograms) of Boys, Age Four Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters															
	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9
57.6	4.75	4.93	5.10	5.28	5.46	5.63	5.81	5.98	6.16	6.34	6.51	6.69	6.87	7.04	7.22	7.39
57.2	4.66	4.83	5.01	5.19	5.36	5.54	5.72	5.89	6.07	6.24	6.42	6.60	6.77	6.95	7.13	7.30
56.8	4.56	4.74	4.92	5.09	5.27	5.45	5.62	5.80	5.97	6.15	6.33	6.50	6.68	6.86	7.03	7.21
56.4	4.47	4.65	4.82	5.00	5.18	5.35	5.53	5.70	5.88	6.06	6.23	6.41	6.59	6.76	6.94	7.11
56.0	4.38	4.55	4.73	4.91	5.08	5.26	5.43	5.61	5.79	5.96	6.14	6.32	6.49	6.67	6.84	7.02
55.6	4.28	4.46	4.64	4.81	4.99	5.16	5.34	5.52	5.69	5.87	6.05	6.22	6.40	6.57	6.75	6.93
55.2	4.19	4.37	4.54	4.72	4.89	5.07	5.25	5.42	5.60	5.78	5.95	6.13	6.30	6.48	6.66	6.83
54.8	4.10	4.27	4.45	4.63	4.80	4.98	5.15	5.33	5.51	5.68	5.86	6.03	6.21	6.39	6.56	6.74
54.4	4.00	4.18	4.36	4.53	4.71	4.88	5.06	5.24	5.41	5.59	5.77	5.94	6.12	6.29	6.47	6.65
54.0	3.91	4.09	4.26	4.44	4.61	4.79	4.97	5.14	5.32	5.50	5.67	5.85	6.02	6.20	6.38	6.55
53.6	3.82	3.99	4.17	4.34	4.52	4.70	4.87	5.05	5.23	5.40	5.58	5.75	5.93	6.11	6.28	6.46
53.2	3.72	3.90	4.07	4.25	4.43	4.60	4.78	4.96	5.13	5.31	5.48	5.66	5.84	6.01	6.19	6.37
52.8	3.63	3.80	3.98	4.16	4.33	4.51	4.69	4.86	5.04	5.21	5.39	5.57	5.74	5.92	6.10	6.27
52.4	3.54	3.71	3.89	4.06	4.24	4.42	4.59	4.77	4.94	5.12	5.30	5.47	5.65	5.83	6.00	6.18
52.0	3.44	3.62	3.79	3.97	4.15	4.32	4.50	4.68	4.85	5.03	5.20	5.38	5.56	5.73	5.91	6.08
51.6	3.35	3.52	3.70	3.88	4.05	4.23	4.41	4.58	4.76	4.93	5.11	5.29	5.46	5.64	5.82	5.99
51.2	3.25	3.43	3.61	3.78	3.96	4.14	4.31	4.49	4.66	4.84	5.02	5.19	5.37	5.55	5.72	5.90
50.8	3.16	3.34	3.51	3.69	3.87	4.04	4.22	4.39	4.57	4.75	4.92	5.10	5.28	5.45	5.63	5.80
50.4	3.07	3.24	3.42	3.60	3.77	3.95	4.12	4.30	4.48	4.65	4.83	5.01	5.18	5.36	5.53	5.71
50.0	2.97	3.15	3.33	3.50	3.68	3.85	4.03	4.21	4.38	4.56	4.74	4.91	5.09	5.26	5.44	5.62
49.6	2.88	3.06	3.23	3.41	3.59	3.76	3.94	4.11	4.29	4.47	4.64	4.82	4.99	5.17	5.35	5.52
49.2	2.79	2.96	3.14	3.32	3.49	3.67	3.84	4.02	4.20	4.37	4.55	4.73	4.90	5.08	5.25	5.43
48.8	2.69	2.87	3.05	3.22	3.40	3.57	3.75	3.93	4.10	4.28	4.46	4.63	4.81	4.98	5.16	5.34
48.4	2.60	2.78	2.95	3.13	3.30	3.48	3.66	3.83	4.01	4.19	4.36	4.54	4.71	4.89	5.07	5.24

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.02
.2	.05
.3	.07

Table 24

Predicting Weight (Kilograms) of Boys, Age Five Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centi-meters	Hip Width, Centimeters																				
	15.6	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6
128	7.50	7.56	7.62	7.67	7.73	7.79	7.85	7.91	7.97	8.03	8.09	8.14	8.20	8.26	8.32	8.38	8.44	8.50	8.56	8.62	8.67
127	7.38	7.44	7.50	7.56	7.62	7.68	7.74	7.80	7.86	7.91	7.97	8.03	8.09	8.15	8.21	8.27	8.33	8.38	8.44	8.50	8.56
126	7.27	7.33	7.39	7.45	7.51	7.57	7.62	7.68	7.74	7.80	7.86	7.92	7.98	8.04	8.10	8.15	8.21	8.27	8.33	8.39	8.45
125	7.16	7.22	7.28	7.34	7.39	7.45	7.51	7.57	7.63	7.69	7.75	7.81	7.87	7.92	7.98	8.04	8.10	8.16	8.22	8.28	8.34
124	7.05	7.11	7.16	7.22	7.28	7.34	7.40	7.46	7.52	7.58	7.63	7.69	7.75	7.81	7.87	7.93	7.99	8.05	8.11	8.16	8.22
123	6.93	6.99	7.05	7.11	7.17	7.23	7.29	7.35	7.40	7.46	7.52	7.58	7.64	7.70	7.76	7.82	7.87	7.93	7.99	8.05	8.11
122	6.82	6.88	6.94	7.00	7.06	7.11	7.17	7.23	7.29	7.35	7.41	7.47	7.53	7.59	7.64	7.70	7.76	7.82	7.88	7.94	8.00
121	6.71	6.77	6.83	6.88	6.94	7.00	7.06	7.12	7.18	7.24	7.30	7.36	7.41	7.47	7.53	7.59	7.65	7.71	7.77	7.83	7.88
120	6.60	6.65	6.71	6.77	6.83	6.89	6.95	7.01	7.07	7.12	7.18	7.24	7.30	7.36	7.42	7.48	7.54	7.60	7.65	7.71	7.77
119	6.48	6.54	6.60	6.66	6.72	6.78	6.84	6.89	6.95	7.01	7.07	7.13	7.19	7.25	7.31	7.36	7.42	7.48	7.54	7.60	7.66
118	6.37	6.43	6.49	6.55	6.60	6.66	6.72	6.78	6.84	6.90	6.96	7.02	7.08	7.13	7.19	7.25	7.31	7.37	7.43	7.49	7.55
117	6.26	6.32	6.37	6.43	6.49	6.55	6.61	6.67	6.73	6.79	6.85	6.90	6.96	7.02	7.08	7.14	7.20	7.26	7.32	7.37	7.43
116	6.14	6.20	6.26	6.32	6.38	6.44	6.50	6.56	6.61	6.67	6.73	6.79	6.85	6.91	6.97	7.03	7.09	7.14	7.20	7.26	7.32
115	6.03	6.09	6.15	6.21	6.27	6.33	6.38	6.44	6.50	6.56	6.62	6.68	6.74	6.80	6.85	6.91	6.97	7.03	7.09	7.15	7.21
114	5.92	5.98	6.04	6.09	6.15	6.21	6.27	6.33	6.39	6.45	6.51	6.57	6.62	6.68	6.74	6.80	6.86	6.92	6.98	7.04	7.09
113	5.81	5.86	5.92	5.98	6.04	6.10	6.16	6.22	6.28	6.34	6.39	6.45	6.51	6.57	6.63	6.69	6.75	6.81	6.86	6.92	6.98
112	5.69	5.75	5.81	5.87	5.93	5.99	6.05	6.10	6.16	6.22	6.28	6.34	6.40	6.46	6.52	6.58	6.63	6.69	6.75	6.81	6.87
111	5.58	5.64	5.70	5.76	5.82	5.87	5.93	5.99	6.05	6.11	6.17	6.23	6.29	6.34	6.40	6.46	6.52	6.58	6.64	6.70	6.76
110	5.47	5.53	5.58	5.64	5.70	5.76	5.82	5.88	5.94	6.00	6.06	6.11	6.17	6.23	6.29	6.35	6.41	6.47	6.53	6.58	6.64
109	5.35	5.41	5.47	5.53	5.59	5.65	5.71	5.77	5.83	5.88	5.94	6.00	6.06	6.12	6.18	6.24	6.30	6.35	6.41	6.47	6.53
108	5.24	5.30	5.36	5.42	5.48	5.54	5.59	5.65	5.71	5.77	5.83	5.89	5.95	6.01	6.07	6.12	6.18	6.24	6.30	6.36	6.42
107	5.13	5.19	5.25	5.31	5.36	5.42	5.48	5.54	5.60	5.66	5.72	5.78	5.83	5.89	5.95	6.01	6.07	6.13	6.19	6.25	6.31
106	5.02	5.07	5.13	5.19	5.25	5.31	5.37	5.43	5.49	5.55	5.60	5.66	5.72	5.78	5.84	5.90	5.96	6.02	6.07	6.13	6.19
105	4.90	4.96	5.02	5.08	5.14	5.20	5.26	5.31	5.37	5.43	5.49	5.55	5.61	5.67	5.73	5.79	5.84	5.90	5.96	6.02	6.08
104	4.79	4.85	4.91	4.97	5.03	5.08	5.14	5.20	5.26	5.32	5.38	5.44	5.50	5.56	5.61	5.67	5.73	5.79	5.85	5.91	5.97
103	4.68	4.74	4.80	4.85	4.91	4.97	5.03	5.09	5.15	5.21	5.27	5.32	5.38	5.44	5.50	5.56	5.62	5.68	5.74	5.80	5.85
102	4.56	4.62	4.68	4.74	4.80	4.86	4.92	4.98	5.04	5.09	5.15	5.21	5.27	5.33	5.39	5.45	5.51	5.56	5.62	5.68	5.74
101	4.45	4.51	4.57	4.63	4.69	4.75	4.80	4.86	4.92	4.98	5.04	5.10	5.16	5.22	5.28	5.33	5.39	5.45	5.51	5.57	5.63
100	4.34	4.40	4.46	4.52	4.57	4.63	4.69	4.75	4.81	4.87	4.93	4.99	5.05	5.10	5.16	5.22	5.28	5.34	5.40	5.46	5.52
99	4.23	4.29	4.34	4.40	4.46	4.52	4.58	4.64	4.70	4.76	4.81	4.87	4.93	4.99	5.05	5.11	5.17	5.23	5.29	5.34	5.40
98	4.11	4.17	4.23	4.29	4.35	4.41	4.47	4.53	4.58	4.64	4.70	4.76	4.82	4.88	4.94	5.00	5.05	5.11	5.17	5.23	5.29

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.03	.06
.1	.01	.04	.07
.2	.02	.05	.08
.3	.03	.06	.09
.4	.05	.07	.10
.5	.06	.09	.12
.6	.07	.10	.13
.7	.08	.11	.14
.8	.09	.12	.15
.9	.10	.13	.16

Table 25

Predicting Weight (Kilograms) of Boys, Age Five Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																						
	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4
63.0	14.97	15.13	15.30	15.47	15.63	15.80	15.96	16.13	16.30	16.46	16.63	16.79	16.96	17.12	17.29	17.46	17.62	17.79	17.95	18.12	18.28	18.45	18.62
62.4	14.73	14.90	15.06	15.23	15.39	15.56	15.73	15.89	16.06	16.22	16.39	16.56	16.72	16.89	17.05	17.22	17.38	17.55	17.72	17.88	18.05	18.21	18.38
61.8	14.49	14.66	14.83	14.99	15.16	15.32	15.49	15.66	15.82	15.99	16.15	16.32	16.48	16.65	16.82	16.98	17.15	17.31	17.48	17.65	17.81	17.98	18.14
61.2	14.26	14.42	14.59	14.75	14.92	15.09	15.25	15.42	15.58	15.75	15.92	16.08	16.25	16.41	16.58	16.74	16.91	17.08	17.24	17.41	17.57	17.74	17.91
60.6	14.02	14.19	14.35	14.52	14.68	14.85	15.02	15.18	15.35	15.51	15.68	15.84	16.01	16.18	16.34	16.51	16.67	16.84	17.01	17.17	17.34	17.50	17.67
60.0	13.78	13.95	14.11	14.28	14.45	14.61	14.78	14.94	15.11	15.28	15.44	15.61	15.77	15.94	16.10	16.27	16.44	16.60	16.77	16.93	17.10	17.27	17.43
59.4	13.55	13.71	13.88	14.04	14.21	14.38	14.54	14.71	14.87	15.04	15.20	15.37	15.54	15.70	15.87	16.03	16.20	16.37	16.53	16.70	16.86	17.03	17.19
58.8	13.31	13.47	13.64	13.81	13.97	14.14	14.30	14.47	14.64	14.80	14.97	15.13	15.30	15.46	15.63	15.80	15.96	16.13	16.29	16.46	16.63	16.79	16.96
58.2	13.07	13.24	13.40	13.57	13.74	13.90	14.07	14.23	14.40	14.56	14.73	14.90	15.06	15.23	15.39	15.56	15.73	15.89	16.06	16.22	16.39	16.55	16.72
57.6	12.83	13.00	13.17	13.33	13.50	13.66	13.83	14.00	14.16	14.33	14.49	14.66	14.82	14.99	15.16	15.32	15.49	15.65	15.82	15.99	16.15	16.32	16.48
57.0	12.60	12.76	12.93	13.10	13.26	13.43	13.59	13.76	13.92	14.09	14.26	14.42	14.59	14.75	14.92	15.09	15.25	15.42	15.58	15.75	15.91	16.08	16.25
56.4	12.36	12.53	12.69	12.86	13.02	13.19	13.36	13.52	13.69	13.85	14.02	14.18	14.35	14.52	14.68	14.85	15.01	15.18	15.35	15.51	15.68	15.84	16.01
55.8	12.12	12.29	12.46	12.62	12.79	12.95	13.12	13.28	13.45	13.62	13.78	13.95	14.11	14.28	14.45	14.61	14.78	14.94	15.11	15.27	15.44	15.61	15.77
55.2	11.89	12.05	12.22	12.38	12.55	12.72	12.88	13.05	13.21	13.38	13.54	13.71	13.88	14.04	14.21	14.37	14.54	14.71	14.87	15.04	15.20	15.37	15.54
54.6	11.65	11.82	11.98	12.15	12.31	12.48	12.64	12.81	12.98	13.14	13.31	13.47	13.64	13.81	13.97	14.14	14.30	14.47	14.63	14.80	14.97	15.13	15.30
54.0	11.41	11.58	11.74	11.91	12.08	12.24	12.41	12.57	12.74	12.90	13:07	13.24	13.40	13.57	13.73	13.90	14.07	14.23	14.40	14.56	14.73	14.90	15.06
53.4	11.18	11.34	11.51	11.67	11.84	12.00	12.17	12.34	12.50	12.67	12.83	13.00	13.17	13.33	13.50	13.66	13.83	13.99	14.16	14.33	14.49	14.66	14.82
52.8	10.94	11.10	11.27	11.44	11.60	11.77	11.93	12.10	12.26	12.43	12.60	12.76	12.93	13.09	13.26	13.43	13.59	13.76	13.92	14.09	14.26	14.42	14.59
52.2	10.70	10.87	11.03	11.20	11.36	11.53	11.70	11.86	12.03	12.19	12.36	12.53	12.69	12.86	13.02	13.19	13.35	13.52	13.69	13.85	14.02	14.18	14.25
51.6	10.46	10.63	10.80	10.96	11.13	11.29	11.46	11.63	11.79	11.96	12.12	12.29	12.45	12.62	12.79	12.95	13.12	13.28	13.45	13.62	13.78	13.95	14.11
51.0	10.23	10.39	10.56	10.72	10.89	11.06	11.22	11.39	11.55	11.72	11.89	12.05	12.22	12.38	12.55	12.71	12.88	13.05	13.21	13.38	13.54	13.71	13.88
50.4	9.99	10.16	10.32	10.49	10.65	10.82	10.99	11.15	11.32	11.48	11.65	11.81	11.98	12.15	12.31	12.48	12.64	12.81	12.98	13.14	13.31	13.47	13.64
49.8	9.75	9.92	10.08	10.25	10.42	10.58	10.75	10.91	11.08	11.25	11.41	11.58	11.74	11.91	12.07	12.24	12.41	12.57	12.74	12.90	13.07	13.24	13.40
49.2	9.52	9.68	9.85	10.01	10.18	10.35	10.51	10.68	10.84	11.01	11.17	11.34	11.51	11.67	11.84	12.00	12.17	12.34	12.50	12.67	12.83	13.00	13.16
48.6	9.28	9.44	9.61	9.78	9.94	10.11	10.27	10.44	10.61	10.77	10.94	11.10	11.27	11.43	11.60	11.77	11.93	12.10	12.26	12.43	12.60	12.76	12.93
48.0	9.04	9.21	9.37	9.54	9.71	9.86	10.04	10.20	10.37	10.53	10.70	10.87	11.03	11.20	11.36	11.53	11.70	11.86	12.03	12.19	12.36	12.52	12.69
47.4	8.80	8.97	9.14	9.30	9.47	9.63	9.80	9.97	10.13	10.30	10.46	10.63	10.79	10.96	11.13	11.29	11.46	11.62	11.79	11.96	12.12	12.29	12.45

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.04
.2	.08
.3	.12
.4	.16
.5	.20

Table 26

Predicting Weight (Kilograms) of Boys, Age Six Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																						
	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8
133	15.11	15.22	15.33	15.45	15.56	15.68	15.79	15.90	16.02	16.13	16.24	16.35	16.47	16.58	16.70	16.81	16.92	17.04	17.15	17.26	17.38	17.49	17.61
132	14.92	15.03	15.14	15.26	15.37	15.48	15.60	15.71	15.82	15.94	16.05	16.17	16.28	16.39	16.51	16.62	16.73	16.85	16.96	17.07	17.19	17.30	17.41
131	14.73	14.84	14.95	15.07	15.18	15.29	15.41	15.52	15.63	15.75	15.86	15.97	16.09	16.20	16.31	16.43	16.54	16.66	16.77	16.88	17.00	17.11	17.22
130	14.53	14.65	14.76	14.87	14.99	15.10	15.22	15.33	15.44	15.56	15.67	15.78	15.90	16.01	16.12	16.24	16.35	16.46	16.58	16.69	16.80	16.92	17.03
129	14.34	14.46	14.57	14.68	14.80	14.91	15.02	15.14	15.25	15.36	15.48	15.59	15.71	15.82	15.93	16.05	16.16	16.27	16.39	16.50	16.61	16.73	16.84
128	14.15	14.27	14.38	14.49	14.61	14.72	14.83	14.95	15.06	15.17	15.29	15.40	15.51	15.63	15.74	15.85	15.97	16.08	16.20	16.31	16.42	16.54	16.65
127	13.96	14.07	14.19	14.30	14.41	14.53	14.64	14.76	14.87	14.98	15.10	15.21	15.32	15.44	15.55	15.66	15.78	15.89	16.00	16.12	16.23	16.34	16.46
126	13.77	13.88	14.00	14.11	14.22	14.34	14.45	14.56	14.68	14.79	14.90	15.02	15.13	15.25	15.36	15.47	15.59	15.70	15.81	15.93	16.04	16.15	16.27
125	13.58	13.69	13.81	13.92	14.03	14.15	14.26	14.37	14.49	14.60	14.71	14.83	14.94	15.05	15.17	15.28	15.39	15.51	15.62	15.74	15.85	15.96	16.08
124	13.39	13.50	13.61	13.73	13.84	13.95	14.07	14.18	14.30	14.41	14.52	14.64	14.75	14.86	14.98	15.09	15.20	15.32	15.43	15.54	15.66	15.77	15.88
123	13.20	13.31	13.42	13.54	13.65	13.76	13.88	13.99	14.10	14.22	14.33	14.44	14.56	14.67	14.79	14.90	15.01	15.13	15.24	15.35	15.47	15.58	15.69
122	13.00	13.12	13.23	13.34	13.46	13.57	13.69	13.80	13.91	14.03	14.14	14.25	14.37	14.48	14.59	14.71	14.82	14.93	15.05	15.16	15.28	15.39	15.50
121	12.81	12.93	13.04	13.15	13.27	13.38	13.49	13.61	13.72	13.84	13.95	14.06	14.18	14.29	14.40	14.52	14.63	14.74	14.86	14.97	15.09	15.20	15.31
120	12.62	12.74	12.85	12.96	13.08	13.19	13.30	13.42	13.53	13.64	13.76	13.87	13.98	14.10	14.21	14.33	14.44	14.55	14.67	14.78	14.89	15.01	15.12
119	12.43	12.54	12.66	12.77	12.88	13.00	13.11	13.23	13.34	13.45	13.57	13.68	13.79	13.91	14.02	14.13	14.25	14.36	14.47	14.59	14.70	14.82	14.93
118	12.24	12.35	12.47	12.58	12.69	12.81	12.92	13.03	13.15	13.26	13.38	13.49	13.60	13.72	13.83	13.94	14.06	14.17	14.28	14.40	14.51	14.62	14.74
117	12.05	12.16	12.28	12.39	12.50	12.62	12.73	12.84	12.96	13.07	13.18	13.30	13.41	13.52	13.64	13.75	13.87	13.98	14.09	14.21	14.32	14.43	14.55
116	11.86	11.97	12.08	12.20	12.31	12.42	12.54	12.65	12.77	12.88	12.99	13.11	13.22	13.33	13.45	13.56	13.67	13.79	13.90	14.01	14.13	14.24	14.36
115	11.67	11.78	11.89	12.01	12.12	12.23	12.35	12.46	12.57	12.69	12.80	12.91	13.03	13.14	13.26	13.37	13.48	13.60	13.71	13.82	13.94	14.05	14.16
114	11.47	11.59	11.70	11.82	11.93	12.04	12.16	12.27	12.38	12.50	12.61	12.72	12.84	12.95	13.06	13.18	13.29	13.41	13.52	13.63	13.75	13.86	13.97
113	11.28	11.40	11.51	11.62	11.74	11.85	11.96	12.08	12.19	12.31	12.42	12.53	12.65	12.76	12.87	12.99	13.10	13.21	13.33	13.44	13.55	13.67	13.78
112	11.09	11.21	11.32	11.43	11.55	11.66	11.77	11.89	12.00	12.11	12.23	12.34	12.45	12.57	12.68	12.80	12.91	13.02	13.14	13.25	13.36	13.48	13.59
111	10.90	11.01	11.13	11.24	11.36	11.47	11.58	11.70	11.81	11.92	12.04	12.15	12.26	12.38	12.49	12.60	12.72	12.83	12.95	13.06	13.17	13.29	13.40
110	10.71	10.82	10.94	11.05	11.16	11.28	11.39	11.50	11.62	11.73	11.85	11.96	12.07	12.19	12.30	12.41	12.53	12.64	12.75	12.87	12.98	13.09	13.21
109	10.52	10.63	10.75	10.86	10.97	11.09	11.20	11.31	11.43	11.54	11.65	11.77	11.88	11.99	12.11	12.22	12.34	12.45	12.56	12.68	12.79	12.90	13.02
108	10.33	10.44	10.55	10.67	10.78	10.90	11.01	11.12	11.24	11.35	11.46	11.58	11.69	11.80	11.92	12.03	12.14	12.26	12.37	12.48	12.60	12.71	12.83
107	10.14	10.25	10.36	10.48	10.59	10.70	10.82	10.93	11.04	11.16	11.27	11.39	11.50	11.61	11.73	11.84	11.95	12.07	12.18	12.29	12.41	12.52	12.63
106	9.95	10.06	10.17	10.29	10.40	10.51	10.63	10.74	10.85	10.97	11.08	11.19	11.31	11.42	11.53	11.65	11.76	11.88	11.99	12.10	12.22	12.33	12.44
105	9.75	9.87	9.98	10.09	10.21	10.32	10.44	10.55	10.66	10.78	10.89	11.00	11.12	11.23	11.34	11.46	11.57	11.68	11.80	11.91	12.02	12.14	12.25
104	9.56	9.68	9.79	9.90	10.02	10.13	10.24	10.36	10.47	10.58	10.70	10.81	10.93	11.04	11.15	11.27	11.38	11.49	11.61	11.72	11.83	11.95	12.06

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.04	.08
.1	.02	.06	.09
.2	.04	.08	.11
.3	.06	.10	.13
.4	.08	.11	.15
.5	.10	.13	.17
.6	.11	.15	.19
.7	.13	.17	.21
.8	.15	.19	.23
.9	.17	.21	.25

Table 27

Predicting Weight (Kilograms) of Boys, Age Six Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																				
	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5
65.4	13.34	13.41	13.49	13.56	13.63	13.70	13.78	13.85	13.92	13.99	14.07	14.14	14.21	14.28	14.36	14.43	14.50	14.57	14.65	14.72	14.79
64.8	12.99	13.06	13.13	13.20	13.28	13.35	13.42	13.49	13.57	13.64	13.71	13.78	13.86	13.93	14.00	14.07	14.15	14.22	14.29	14.36	14.44
64.2	12.63	12.70	12.78	12.85	12.92	12.99	13.07	13.14	13.21	13.28	13.36	13.43	13.50	13.57	13.65	13.72	13.79	13.86	13.94	14.01	14.08
63.6	12.28	12.35	12.42	12.50	12.57	12.64	12.71	12.78	12.86	12.93	13.00	13.07	13.15	13.22	13.29	13.36	13.44	13.51	13.58	13.65	13.73
63.0	11.92	12.00	12.07	12.14	12.21	12.29	12.36	12.43	12.50	12.58	12.65	12.72	12.79	12.87	12.94	13.01	13.08	13.16	13.23	13.30	13.37
62.4	11.57	11.64	11.71	11.79	11.86	11.93	12.00	12.08	12.15	12.22	12.29	12.37	12.44	12.51	12.58	12.66	12.73	12.80	12.87	12.95	13.02
61.8	11.21	11.29	11.36	11.43	11.50	11.58	11.65	11.72	11.79	11.87	11.94	12.01	12.06	12.16	12.23	12.30	12.37	12.45	12.52	12.59	12.66
61.2	10.86	10.93	11.00	11.08	11.15	11.22	11.29	11.37	11.44	11.51	11.58	11.66	11.73	11.80	11.87	11.95	12.02	12.09	12.16	12.24	12.31
60.6	10.51	10.58	10.65	10.72	10.80	10.87	10.94	11.01	11.09	11.16	11.23	11.30	11.38	11.45	11.52	11.59	11.66	11.74	11.81	11.88	11.95
60.0	10.15	10.22	10.30	10.37	10.44	10.51	10.59	10.66	10.73	10.80	10.88	10.95	11.02	11.09	11.17	11.24	11.31	11.38	11.46	11.53	11.60
59.4	9.80	9.87	9.94	10.01	10.09	10.16	10.23	10.30	10.38	10.45	10.52	10.59	10.67	10.74	10.81	10.88	10.96	11.03	11.10	11.17	11.25
58.8	9.44	9.51	9.59	9.66	9.73	9.80	9.88	9.95	10.02	10.09	10.17	10.24	10.31	10.38	10.46	10.53	10.60	10.67	10.75	10.82	10.89
58.2	9.09	9.16	9.23	9.31	9.38	9.45	9.52	9.60	9.67	9.74	9.81	9.88	9.96	10.03	10.10	10.17	10.25	10.32	10.39	10.46	10.54
57.6	8.73	8.81	8.88	8.95	9.02	9.10	9.17	9.24	9.31	9.39	9.46	9.53	9.60	9.68	9.75	9.82	9.89	9.97	10.04	10.11	10.18
57.0	8.38	8.45	8.52	8.60	8.67	8.74	8.81	8.89	8.96	9.03	9.10	9.18	9.25	9.32	9.39	9.47	9.54	9.61	9.68	9.76	9.83
56.4	8.02	8.10	8.17	8.24	8.31	8.39	8.46	8.53	8.60	8.68	8.75	8.82	8.89	8.97	9.04	9.11	9.18	9.26	9.33	9.40	9.47
55.8	7.67	7.74	7.82	7.89	7.96	8.03	8.11	8.18	8.25	8.32	8.39	8.47	8.54	8.61	8.68	8.76	8.83	8.90	8.97	9.05	9.12
55.2	7.32	7.39	7.46	7.53	7.61	7.68	7.75	7.82	7.90	7.97	8.04	8.11	8.19	8.26	8.33	8.40	8.48	8.55	8.62	8.69	8.76
54.6	6.96	7.03	7.11	7.18	7.25	7.32	7.40	7.47	7.54	7.61	7.69	7.76	7.83	7.90	7.98	8.05	8.12	8.19	8.27	8.34	8.41
54.0	6.61	6.68	6.75	6.82	6.90	6.97	7.04	7.11	7.19	7.26	7.33	7.40	7.48	7.55	7.62	7.69	7.77	7.84	7.91	7.98	8.06
53.4	6.25	6.33	6.40	6.47	6.54	6.61	6.69	6.76	6.83	6.90	6.98	7.05	7.12	7.19	7.27	7.34	7.41	7.48	7.56	7.63	7.70
52.8	5.90	5.97	6.04	6.12	6.19	6.26	6.33	6.41	6.48	6.55	6.62	6.70	6.77	6.84	6.91	6.98	7.06	7.13	7.20	7.27	7.35
52.2	5.54	5.62	5.69	5.76	5.83	5.91	5.98	6.05	6.12	6.20	6.27	6.34	6.41	6.49	6.56	6.63	6.70	6.78	6.85	6.92	6.99
51.6	5.19	5.26	5.33	5.41	5.48	5.55	5.62	5.70	5.77	5.84	5.91	5.99	6.06	6.13	6.20	6.28	6.35	6.42	6.49	6.57	6.64
51.0	4.83	4.91	4.98	5.05	5.12	5:20	5.27	5.34	5.41	5.49	5.56	5.63	5.70	5.78	5.85	5.92	5.99	6.07	6.14	6.21	6.28
50.6	4.48	4.55	4.63	4.70	4.77	4.84	4.92	4.99	5.06	5.13	5.21	5.28	5.35	5.42	5.49	5.57	5.64	5.71	5.78	5.86	5.93
50.2	4.13	4.20	4.27	4.34	4.42	4.49	4.56	4.63	4.71	4.78	4.85	4.92	5.00	5.07	5.14	5.21	5.29	5.36	5.43	5.50	5.58
49.8	3.77	3.84	3.92	3.99	4.06	4.13	4.21	4.28	4.35	4.42	4.50	4.57	4.64	4.71	4.79	4.86	4.93	5.00	5.08	5.15	5.22
49.4	3.42	3.49	3.56	3.63	3.71	3.78	3.85	3.92	4.00	4.07	4.14	4.21	4.29	4.36	4.43	4.50	4.58	4.65	4.72	4.79	4.87

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.059
.2	.118
.3	.177
.4	.236
.5	.295

Table 28

Predicting Weight (Kilograms) of Boys, Age Seven Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centi-meters	Hip Width, Centimeters																						
	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1
141.0	15.46	15.65	15.83	16.02	16.21	16.39	16.58	16.76	16.95	17.14	17.32	17.51	17.69	17.88	18.07	18.25	18.44	18.62	18.81	19.00	19.18	19.37	19.55
139.5	15.27	15.45	15.64	15.83	16.01	16.20	16.38	16.57	16.76	16.94	17.13	17.31	17.50	17.69	17.87	18.06	18.24	18.43	18.62	18.80	18.99	19.17	19.36
138.0	15.07	15.26	15.45	15.63	15.82	16.00	16.19	16.38	16.56	16.75	16.93	17.12	17.31	17.49	17.68	17.86	18.05	18.24	18.42	18.61	18.79	18.98	19.17
136.5	14.88	15.07	15.25	15.44	15.62	15.81	16.00	16.18	16.37	16.55	16.74	16.93	17.11	17.30	17.48	17.67	17.86	18.04	18.23	18.41	18.60	18.79	18.97
135.0	14.69	14.87	15.06	15.24	15.43	15.62	15.80	15.99	16.17	16.36	16.55	16.73	16.92	17.10	17.29	17.48	17.66	17.85	18.03	18.22	18.41	18.59	18.78
133.5	14.49	14.68	14.86	15.05	15.24	15.42	15.61	15.79	15.98	16.17	16.35	16.54	16.72	16.91	17.10	17.28	17.47	17.65	17.84	18.03	18.21	18.40	18.58
132.0	14.30	14.48	14.67	14.86	15.04	15.23	15.41	15.60	15.79	15.97	16.16	16.34	16.53	16.72	16.90	17.09	17.27	17.46	17.65	17.83	18.02	18.20	18.39
130.5	14.11	14.29	14.48	14.66	14.85	15.03	15.22	15.41	15.59	15.78	15.96	16.15	16.34	16.52	16.71	16.89	17.08	17.27	17.45	17.64	17.82	18.01	18.20
129.0	13.91	14.10	14.28	14.47	14.65	14.84	15.03	15.21	15.40	15.58	15.77	15.96	16.14	16.33	16.51	16.70	16.89	17.07	17.26	17.44	17.63	17.82	18.00
127.5	13.72	13.90	14.09	14.28	14.46	14.65	14.83	15.02	15.20	15.39	15.58	15.76	15.95	16.13	16.32	16.51	16.69	16.88	17.06	17.25	17.44	17.62	17.81
126.0	13.52	13.71	13.90	14.08	14.27	14.45	14.64	14.82	15.01	15.20	15.38	15.57	15.75	15.94	16.13	16.31	16.50	16.68	16.87	17.06	17.24	17.43	17.61
124.5	13.33	13.52	13.70	13.89	14.07	14.26	14.45	14.63	14.82	15.00	15.19	15.37	15.56	15.75	15.93	16.12	16.30	16.49	16.68	16.86	17.05	17.23	17.42
123.0	13.14	13.32	13.51	13.69	13.88	14.07	14.25	14.44	14.62	14.81	14.99	15.18	15.37	15.55	15.74	15.92	16.11	16.30	16.48	16.67	16.85	17.04	17.23
121.5	12.94	13.13	13.31	13.50	13.69	13.87	14.06	14.24	14.43	14.62	14.80	14.99	15.17	15.36	15.54	15.73	15.92	16.10	16.29	16.47	16.66	16.85	17.03
120.0	12.75	12.93	13.12	13.31	13.49	13.68	13.86	14.05	14.24	14.42	14.61	14.79	14.98	15.16	15.35	15.54	15.72	15.91	16.09	16.28	16.47	16.65	16.84
118.5	12.55	12.74	12.93	13.11	13.30	13.48	13.67	13.86	14.04	14.23	14.41	14.60	14.79	14.97	15.16	15.34	15.53	15.71	15.90	16.09	16.27	16.46	16.64
117.0	12.36	12.55	12.73	12.92	13.10	13.29	13.48	13.66	13.85	14.03	14.22	14.41	14.59	14.78	14.96	15.15	15.33	15.52	15.71	15.89	16.08	16.26	16.45
115.5	12.17	12.35	12.54	12.72	12.91	13.10	13.28	13.47	13.65	13.84	14.03	14.21	14.40	14.58	14.77	14.96	15.14	15.33	15.51	15.70	15.89	16.07	16.26
114.0	11.97	12.16	12.34	12.53	12.72	12.90	13.09	13.27	13.46	13.65	13.83	14.02	14.20	14.39	14.58	14.76	14.95	15.13	15.32	15.50	15.69	15.88	16.06
112.5	11.78	11.96	12.15	12.34	12.52	12.71	12.89	13.08	13.27	13.45	13.64	13.82	14.01	14.20	14.38	14.57	14.75	14.94	15.13	15.31	15.50	15.68	15.87
111.0	11.58	11.77	11.96	12.14	12.33	12.51	12.70	12.89	13.07	13.26	13.44	13.63	13.82	14.00	14.19	14.37	14.56	14.75	14.93	15.12	15.30	15.49	15.67
109.5	11.39	11.58	11.76	11.95	12.13	12.32	12.51	12.69	12.88	13.06	13.25	13.44	13.62	13.81	13.99	14.18	14.37	14.55	14.74	14.92	15.11	15.30	15.48
108.0	11.20	11.38	11.57	11.75	11.94	12.13	12.31	12.50	12.68	12.87	13.05	13.24	13.43	13.61	13.80	13.99	14.17	14.36	14.54	14.73	14.92	15.10	15.29
106.5	11.00	11.19	11.37	11.56	11.75	11.93	12.12	12.30	12.49	12.68	12.86	13.05	13.23	13.42	13.61	13.79	13.98	14.16	14.35	14.54	14.72	14.91	15.09

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.06	.12
.1	.01	.07	.14
.2	.03	.09	.15
.3	.04	.10	.16
.4	.05	.11	.18
.5	.06	.13	.19
.6	.08	.14	.20
.7	.09	.15	.21
.8	.10	.17	.23
.9	.12	.18	.24
1.0	.13	.19	.25
1.1	.14	.20	.27
1.2	.15	.22	.28
1.3	.17	.23	.29
1.4	.18	.24	.30

Table 29

Predicting Weight (Kilograms) of Boys, Age Seven Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters														
	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2
68.0	12.04	12.32	12.59	12.87	13.14	13.42	13.69	13.97	14.24	14.52	14.79	15.07	15.34	15.62	15.89
67.2	11.65	11.93	12.20	12.48	12.75	13.03	13.30	13.58	13.85	14.13	14.40	14.68	14.95	15.23	15.50
66.4	11.26	11.54	11.81	12.09	12.36	12.64	12.91	13.19	13.46	13.74	14.01	14.29	14.56	14.83	15.11
65.6	10.87	11.15	11.42	11.70	11.97	12.25	12.52	12.79	13.07	13.34	13.62	13.89	14.17	14.44	14.72
64.8	10.48	10.75	11.03	11.30	11.58	11.85	12.13	12.40	12.68	12.95	13.23	13.50	13.78	14.05	14.33
64.0	10.09	10.36	10.64	10.91	11.19	11.46	11.74	12.01	12.29	12.56	12.84	13.11	13.39	13.66	13.94
63.2	9.70	9.97	10.25	10.52	10.80	11.07	11.35	11.62	11.90	12.17	12.45	12.72	13.00	13.27	13.54
62.4	9.31	9.58	9.86	10.13	10.41	10.68	10.96	11.23	11.50	11.78	12.05	12.33	12.60	12.88	13.15
61.6	8.92	9.19	9.46	9.74	10.01	10.29	10.56	10.84	11.11	11.39	11.66	11.94	12.21	12.49	12.76
60.8	8.52	8.80	9.07	9.35	9.62	9.90	10.17	10.45	10.72	11.00	11.27	11.55	11.82	12.10	12.37
60.0	8.13	8.41	8.68	8.96	9.23	9.51	9.78	10.06	10.33	10.61	10.88	11.16	11.43	11.71	11.98
59.2	7.74	8.02	8.29	8.57	8.84	9.12	9.39	9.67	9.94	10.21	10.49	10.76	11.04	11.31	11.59
58.4	7.35	7.63	7.90	8.17	8.45	8.72	9.00	9.27	9.55	9.82	10.10	10.37	10.65	10.92	11.20
57.6	6.96	7.23	7.51	7.78	8.06	8.33	8.61	8.88	9.16	9.43	9.71	9.98	10.26	10.53	10.81
56.8	6.57	6.84	7.12	7.39	7.67	7.94	8.22	8.49	8.77	9.04	9.32	9.59	9.87	10.14	10.42
56.0	6.18	6.45	6.73	7.00	7.28	7.55	7.83	8.10	8.38	8.65	8.92	9.20	9.47	9.75	10.02
55.2	5.79	6.06	6.34	6.61	6.88	7.16	7.43	7.71	7.98	8.26	8.53	8.81	9.08	9.36	9.63
54.4	5.39	5.67	5.94	6.22	6.49	6.77	7.04	7.32	7.59	7.87	8.14	8.42	8.69	8.97	9.24
53.6	5.00	5.28	5.55	5.83	6.10	6.38	6.65	6.93	7.20	7.48	7.75	8.03	8.30	8.58	8.85
52.8	4.61	4.89	5.16	5.44	5.71	5.99	6.26	6.54	6.81	7.09	7.36	7.63	7.91	8.18	8.46
52.0	4.22	4.50	4.77	5.05	5.32	5.59	5.87	6.14	6.42	6.69	6.97	7.24	7.52	7.79	8.07
51.2	3.83	4.10	4.38	4.65	4.93	5.20	5.48	5.75	6.03	6.30	6.58	6.85	7.13	7.40	7.68
50.4	3.44	3.71	3.99	4.26	4.54	4.81	5.09	5.36	5.64	5.91	6.19	6.46	6.74	7.01	7.29

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.137
.1	.049	.186
.2	.098	.235
.3	.147	.284
.4	.196	.333
.5	.245	.382
.6	.293	.431
.7	.342	.480

Table 30

Predicting Weight (Kilograms) of Boys, Age Eight Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																						
	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1	23.4	23.7	24.0	24.3
147	20.48	20.60	20.72	20.84	20.97	21.09	21.21	21.33	21.45	21.57	21.69	21.81	21.93	22.05	22.17	22.29	22.42	22.54	22.66	22.78	22.90	23.02	23.14
146	20.32	20.44	20.56	20.68	20.80	20.93	21.05	21.17	21.29	21.41	21.53	21.65	21.77	21.89	22.01	22.13	22.25	22.38	22.50	22.62	22.74	22.86	22.98
145	20.16	20.28	20.40	20.52	20.64	20.76	20.89	21.01	21.13	21.25	21.37	21.49	21.61	21.73	21.85	21.97	22.09	22.21	22.34	22.46	22.58	22.70	22.82
144	20.00	20.12	20.24	20.36	20.48	20.60	20.72	20.85	20.97	21.09	21.21	21.33	21.45	21.57	21.69	21.81	21.93	22.05	22.17	22.30	22.42	22.54	22.66
143	19.84	19.96	20.08	20.20	20.32	20.44	20.56	20.68	20.81	20.93	21.05	21.17	21.29	21.41	21.53	21.65	21.77	21.89	22.01	22.13	22.26	22.38	22.50
142	19.68	19.80	19.92	20.04	20.16	20.28	20.40	20.52	20.64	20.77	20.89	21.01	21.13	21.25	21.37	21.49	21.61	21.73	21.85	21.97	22.09	22.22	22.34
141	19.52	19.64	19.76	19.88	20.00	20.12	20.24	20.36	20.48	20.60	20.73	20.85	20.97	21.09	21.21	21.33	21.45	21.57	21.69	21.81	21.93	22.06	22.18
140	19.36	19.48	19.60	19.72	19.84	19.96	20.08	20.20	20.32	20.44	20.57	20.69	20.81	20.93	21.05	21.17	21.29	21.41	21.53	21.65	21.77	21.89	22.02
139	19.20	19.32	19.44	19.56	19.68	19.80	19.92	20.04	20.16	20.28	20.40	20.53	20.65	20.77	20.89	21.01	21.13	21.25	21.37	21.49	21.61	21.73	21.85
138	19.04	19.16	19.28	19.40	19.52	19.64	19.76	19.88	20.00	20.12	20.24	20.36	20.49	20.61	20.73	20.85	20.97	21.09	21.21	21.33	21.45	21.57	21.69
137	18.87	19.00	19.12	19.24	19.36	19.48	19.60	19.72	19.84	19.96	20.08	20.20	20.32	20.45	20.57	20.69	20.81	20.93	21.05	21.17	21.29	21.41	21.53
136	18.71	18.83	18.96	19.08	19.20	19.32	19.44	19.56	19.68	19.80	19.92	20.04	20.16	20.28	20.41	20.53	20.65	20.77	20.89	21.01	21.13	21.25	21.37
135	18.55	18.67	18.79	18.92	19.04	19.16	19.28	19.40	19.52	19.64	19.76	19.88	20.00	20.12	20.24	20.37	20.49	20.61	20.73	20.85	20.97	21.09	21.21
134	18.39	18.51	18.63	18.75	18.88	19.00	19.12	19.24	19.36	19.48	19.60	19.72	19.84	19.96	20.08	20.21	20.33	20.45	20.57	20.69	20.81	20.93	21.05
133	18.23	18.35	18.47	18.59	18.72	18.84	18.96	19.08	19.20	19.32	19.44	19.56	19.68	19.80	19.92	20.04	20.17	20.29	20.41	20.53	20.65	20.77	20.89
132	18.07	18.19	18.31	18.43	18.55	18.68	18.80	18.92	19.04	19.16	19.28	19.40	19.52	19.64	19.76	19.88	20.00	20.13	20.25	20.37	20.49	20.61	20.73
131	17.91	18.03	18.15	18.27	18.39	18.51	18.64	18.76	18.88	19.00	19.12	19.24	19.36	19.48	19.60	19.72	19.84	19.96	20.09	20.21	20.33	20.45	20.57
130	17.75	17.87	17.99	18.11	18.23	18.35	18.47	18.60	18.72	18.84	18.96	19.08	19.20	19.32	19.44	19.56	19.68	19.80	19.92	20.05	20.17	20.29	20.41
129	17.59	17.71	17.83	17.95	18.07	18.19	18.31	18.43	18.56	18.68	18.80	18.92	19.04	19.16	19.28	19.40	19.52	19.64	19.76	19.88	20.01	20.13	20.25
128	17.43	17.55	17.67	17.79	17.91	18.03	18.15	18.27	18.39	18.52	18.64	18.76	18.88	19.00	19.12	19.24	19.36	19.48	19.60	19.72	19.85	19.97	20.09
127	17.27	17.39	17.51	17.63	17.75	17.87	17.99	18.11	18.23	18.36	18.48	18.60	18.72	18.84	18.96	19.08	19.20	19.32	19.44	19.56	19.68	19.81	19.93
126	17.11	17.23	17.35	17.47	17.59	17.71	17.83	17.95	18.07	18.19	18.32	18.44	18.56	18.68	18.80	18.92	19.04	19.16	19.28	19.40	19.52	19.64	19.77
125	16.95	17.07	17.19	17.31	17.43	17.55	17.67	17.79	17.91	18.03	18.15	18.28	18.40	18.52	18.64	18.76	18.88	19.00	19.12	19.24	19.36	19.48	19.60
124	16.79	16.91	17.03	17.15	17.27	17.39	17.51	17.63	17.75	17.87	17.99	18.11	18.24	18.36	18.48	18.60	18.72	18.84	18.96	19.08	19.20	19.32	19.44
123	16.62	16.75	16.87	16.99	17.11	17.23	17.35	17.47	17.59	17.71	17.83	17.95	18.07	18.20	18.32	18.44	18.56	18.68	18.80	18.92	19.04	19.16	19.28
122	16.46	16.58	16.71	16.83	16.95	17.07	17.19	17.31	17.43	17.55	17.67	17.79	17.91	18.03	18.16	18.28	18.40	18.52	18.64	18.76	18.88	19.00	19.12
121	16.30	16.42	16.55	16.67	16.79	16.91	17.03	17.15	17.27	17.39	17.51	17.63	17.75	17.87	18.00	18.12	18.24	18.36	18.48	18.60	18.72	18.84	18.96
120	16.14	16.26	16.38	16.51	16.63	16.75	16.87	16.99	17.11	17.23	17.35	17.47	17.59	17.71	17.83	17.96	18.08	18.20	18.32	18.44	18.56	18.68	18.80
119	15.98	16.10	16.22	16.34	16.47	16.59	16.71	16.83	16.95	17.07	17.19	17.31	17.43	17.55	17.67	17.79	17.92	18.04	18.16	18.28	18.40	18.52	18.64
118	15.82	15.94	16.06	16.18	16.30	16.43	16.55	16.67	16.79	16.91	17.03	17.15	17.27	17.39	17.51	17.63	17.75	17.88	18.00	18.12	18.24	18.36	18.48
117	15.66	15.78	15.90	16.02	16.14	16.26	16.39	16.51	16.63	16.75	16.87	16.99	17.11	17.23	17.35	17.47	17.59	17.71	17.84	17.96	18.08	18.20	18.32
116	15.50	15.62	15.74	15.86	15.98	16.10	16.22	16.35	16.47	16.59	16.71	16.83	16.95	17.07	17.19	17.31	17.43	17.55	17.67	17.80	17.92	18.04	18.16

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.04	.08
.1	.02	.06	.10
.2	.03	.08	.11
.3	.05	.09	.13
.4	.06	.11	.15
.5	.08	.12	.16
.6	.10	.14	.18
.7	.11	.16	.19
.8	.13	.17	.21
.9	.14	.19	.23

Table 31

Predicting Weight (Kilograms) of Boys, Age Eight Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																								
	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3
69.0	11.65	11.86	12.08	12.29	12.50	12.72	12.93	13.15	13.36	13.58	13.79	14.01	14.22	14.44	14.65	14.86	15.08	15.29	15.51	15.72	15.94	16.15	16.37	16.58	16.80
68.5	11.31	11.52	11.74	11.95	12.17	12.38	12.59	12.81	13.02	13.24	13.45	13.67	13.88	14.10	14.31	14.53	14.74	14.95	15.17	15.38	15.60	15.81	16.03	16.24	16.46
68.0	10.97	11.18	11.40	11.61	11.83	12.04	12.25	12.47	12.68	12.90	13.11	13.33	13.54	13.76	13.97	14.19	14.40	14.61	14.83	15.04	15.26	15.47	15.69	15.90	16.12
67.5	10.63	10.84	11.06	11.27	11.49	11.70	11.92	12.13	12.34	12.56	12.77	12.99	13.20	13.42	13.63	13.85	14.06	14.28	14.49	14.70	14.92	15.13	15.35	15.56	15.78
67.0	10.29	10.50	10.72	10.93	11.15	11.36	11.58	11.79	12.01	12.22	12.43	12.65	12.86	13.08	13.29	13.51	13.72	13.94	14.15	14.36	14.58	14.79	15.01	15.22	15.44
66.5	9.95	10.16	10.38	10.59	10.81	11.02	11.24	11.45	11.67	11.88	12.09	12.31	12.52	12.74	12.95	13.17	13.38	13.60	13.81	14.03	14.24	14.45	14.67	14.88	15.10
66.0	9.61	9.82	10.04	10.25	10.47	10.68	10.90	11.11	11.33	11.54	11.76	11.97	12.18	12.40	12.61	12.83	13.04	13.26	13.47	13.69	13.90	14.12	14.33	14.54	14.76
65.5	9.27	9.49	9.70	9.91	10.13	10.34	10.56	10.77	10.99	11.20	11.42	11.63	11.84	12.06	12.27	12.49	12.70	12.92	13.13	13.35	13.56	13.78	13.99	14.20	14.42
65.0	8.93	9.15	9.36	9.57	9.79	10.00	10.22	10.43	10.65	10.86	11.08	11.29	11.51	11.72	11.93	12.15	12.36	12.58	12.79	13.01	13.22	13.44	13.65	13.87	14.08
64.5	8.59	8.81	9.02	9.24	9.45	9.66	9.88	10.09	10.31	10.52	10.74	10.95	11.17	11.38	11.60	11.81	12.02	12.24	12.45	12.67	12.88	13.10	13.31	13.53	13.74
64.0	8.25	8.47	8.68	8.90	9.11	9.32	9.54	9.75	9.97	10.18	10.40	10.61	10.83	11.04	11.26	11.47	11.68	11.90	12.11	12.33	12.54	12.76	12.97	13.19	13.40
63.5	7.91	8.13	8.34	8.56	8.77	8.99	9.20	9.41	9.63	9.84	10.06	10.27	10.49	10.70	10.92	11.13	11.35	11.56	11.77	11.99	12.20	12.42	12.63	12.85	13.06
63.0	7.57	7.79	8.00	8.22	8.43	8.65	8.86	9.07	9.29	9.50	9.72	9.93	10.15	10.36	10.58	10.79	11.01	11.22	11.43	11.65	11.86	12.08	12.29	12.51	12.72
62.5	7.23	7.45	7.66	7.88	8.09	8.31	8.52	8.74	8.95	9.16	9.38	9.59	9.81	10.02	10.24	10.45	10.67	10.88	11.10	11.31	11.52	11.74	11.95	12.17	12.38
62.0	6.89	7.11	7.32	7.54	7.75	7.97	8.18	8.40	8.61	8.83	9.04	9.25	9.47	9.68	9.90	10.11	10.33	10.54	10.76	10.97	11.18	11.40	11.61	11.83	12.04
61.5	6.55	6.77	6.98	7.20	7.41	7.63	7.84	8.06	8.27	8.49	8.70	8.91	9.13	9.34	9.56	9.77	9.99	10.20	10.42	10.63	10.85	11.06	11.27	11.49	11.70
61.0	6.22	6.43	6.64	6.86	7.07	7.29	7.50	7.72	7.93	8.15	8.36	8.58	8.79	9.00	9.22	9.43	9.65	9.86	10.08	10.29	10.51	10.72	10.94	11.15	11.36
60.5	5.88	6.09	6.31	6.52	6.73	6.95	7.16	7.38	7.59	7.81	8.02	8.24	8.45	8.66	8.88	9.09	9.31	9.52	9.74	9.95	10.17	10.38	10.60	10.81	11.02
60.0	5.54	5.75	5.97	6.18	6.39	6.61	6.82	7.04	7.25	7.47	7.68	7.90	8.11	8.33	8.54	8.75	8.97	9.18	9.40	9.61	9.83	10.04	10.26	10.47	10.69
59.5	5.20	5.41	5.63	5.84	6.06	6.27	6.48	6.70	6.91	7.13	7.34	7.56	7.77	7.99	8.20	8.42	8.63	8.84	9.06	9.27	9.49	9.70	9.92	10.13	10.35
59.0	4.86	5.07	5.29	5.50	5.72	5.93	6.14	6.36	6.57	6.79	7.00	7.22	7.43	7.65	7.86	8.08	8.29	8.50	8.72	8.93	9.15	9.36	9.58	9.79	10.01
58.5	4.52	4.73	4.95	5.16	5.38	5.59	5.81	6.02	6.23	6.45	6.66	6.88	7.09	7.31	7.52	7.74	7.95	8.17	8.38	8.59	8.81	9.02	9.24	9.45	9.67
58.0	4.18	4.39	4.61	4.82	5.04	5.25	5.47	5.68	5.90	6.11	6.32	6.54	6.75	6.97	7.18	7.40	7.61	7.83	8.04	8.25	8.47	8.68	8.90	9.11	9.33
57.5	3.84	4.05	4.27	4.48	4.70	4.91	5.13	5.34	5.56	5.77	5.98	6.20	6.41	6.63	6.84	7.06	7.27	7.49	7.70	7.92	8.13	8.34	8.56	8.77	8.99
57.0	3.50	3.71	3.93	4.14	4.36	4.57	4.79	5.00	5.22	5.43	5.55	5.86	6.07	6.29	6.50	6.72	6.93	7.15	7.36	7.58	7.79	8.01	8.22	8.43	8.65
56.5	3.16	3.37	3.59	3.80	4.02	4.23	4.45	4.66	4.88	5.09	5.31	5.52	5.73	5.95	6.16	6.38	6.59	6.81	7.02	7.24	7.45	7.67	7.88	8.09	8.31
56.0	2.82	3.04	3.25	3.46	3.68	3.89	4.11	4.32	4.54	4.75	4.97	5.18	5.40	5.61	5.82	6.04	6.25	6.47	6.68	6.90	7.11	7.33	7.54	7.76	7.97
55.5	2.48	2.70	2.91	3.13	3.34	3.55	3.77	3.98	4.20	4.41	4.63	4.84	5.06	5.27	5.48	5.70	5.91	6.13	6.34	6.56	6.77	6.99	7.20	7.42	7.63
55.0	2.14	2.36	2.57	2.79	3.00	3.21	3.43	3.64	3.86	4.07	4.29	4.50	4.72	4.93	5.15	5.36	5.57	5.79	6.00	6.22	6.43	6.65	6.86	7.08	7.29
54.5	1.80	2.02	2.23	2.45	2.66	2.88	3.09	3.30	3.52	3.73	3.95	4.16	4.38	4.59	4.81	5.02	5.24	5.45	5.66	5.88	6.09	6.31	6.52	6.74	6.95
54.0	1.46	1.68	1.89	2.11	2.32	2.54	2.75	2.96	3.18	3.39	3.61	3.82	4.04	4.25	4.47	4.68	4.90	5.11	5.32	5.54	5.75	5.97	6.18	6.40	6.61
53.5	1.12	1.34	1.55	1.77	1.98	2.20	2.41	2.63	2.84	3.05	3.27	3.48	3.70	3.91	4.13	4.34	4.56	4.77	4.99	5.20	5.41	5.63	5.84	6.06	6.27
53.0	.78	1.00	1.21	1.43	1.64	1.86	2.07	2.29	2.50	2.72	2.93	3.14	3.36	3.57	3.79	4.00	4.22	4.43	4.65	4.86	5.07	5.29	5.50	5.72	5.93

Interpolation Table

Chest Circumference	Knee 0
0	0
.1	.068
.2	.136
.3	.204
.4	.272

Table 32

Predicting Weight (Kilograms) of Boys, Age Nine Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centi-meters	Hip Width, Centimeters																								
	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1	23.4	23.7	24.0	24.3	24.6	24.9	25.2
151	20.89	21.07	21.25	21.42	21.60	21.77	21.95	22.13	22.30	22.48	22.66	22.83	23.01	23.19	23.36	23.54	23.72	23.89	24.07	24.25	24.42	24.60	24.78	24.95	25.13
150	20.70	20.88	21.05	21.23	21.41	21.58	21.76	21.94	22.11	22.29	22.47	22.64	22.82	23.00	23.17	23.35	23.53	23.70	23.88	24.06	24.23	24.41	24.59	24.76	24.94
149	20.51	20.69	20.86	21.04	21.22	21.39	21.57	21.75	21.92	22.10	22.28	22.45	22.63	22.81	22.98	23.16	23.34	23.51	23.69	23.87	24.04	24.22	24.40	24.57	24.75
148	20.32	20.50	20.67	20.85	21.03	21.20	21.38	21.56	21.73	21.91	22.09	22.26	22.44	22.62	22.79	22.97	23.15	23.32	23.50	23.68	23.85	24.03	24.20	24.38	24.56
147	20.13	20.31	20.48	20.66	20.84	21.01	21.19	21.37	21.54	21.72	21.90	22.07	22.25	22.43	22.60	22.78	22.95	23.13	23.31	23.48	23.66	23.84	24.01	24.19	24.37
146	19.94	20.12	20.29	20.47	20.65	20.82	21.00	21.18	21.35	21.53	21.70	21.88	22.06	22.23	22.41	22.59	22.76	22.94	23.12	23.29	23.47	23.65	23.82	24.00	24.18
145	19.75	19.92	20.10	20.28	20.45	20.63	20.81	20.98	21.16	21.34	21.51	21.69	21.87	22.04	22.22	22.40	22.57	22.75	22.93	23.10	23.28	23.46	23.63	23.81	23.99
144	19.56	19.73	19.91	20.09	20.26	20.44	20.62	20.79	20.97	21.15	21.32	21.50	21.68	21.85	22.03	22.21	22.38	22.56	22.74	22.91	23.09	23.27	23.44	23.62	23.80
143	19.37	19.54	19.72	19.90	20.07	20.25	20.43	20.60	20.78	20.96	21.13	21.31	21.49	21.66	21.84	22.02	22.19	22.37	22.55	22.72	22.90	23.08	23.25	23.43	23.61
142	19.18	19.35	19.53	19.71	19.88	20.06	20.24	20.41	20.59	20.77	20.94	21.12	21.30	21.47	21.65	21.83	22.00	22.18	22.36	22.53	22.71	22.88	23.06	23.24	23.41
141	18.99	19.16	19.34	19.52	19.69	19.87	20.05	20.22	20.40	20.58	20.75	20.93	21.10	21.28	21.46	21.63	21.81	21.99	22.16	22.34	22.52	22.69	22.87	23.05	23.22
140	18.80	18.97	19.15	19.33	19.50	19.68	19.85	20.03	20.21	20.38	20.56	20.74	20.91	21.09	21.27	21.44	21.62	21.80	21.97	22.15	22.33	22.50	22.68	22.86	23.03
139	18.60	18.78	18.96	19.13	19.31	19.49	19.66	19.84	20.02	20.19	20.37	20.55	20.72	20.90	21.08	21.25	21.43	21.61	21.78	21.96	22.14	22.31	22.49	22.67	22.84
138	18.41	18.59	18.77	18.94	19.12	19.30	19.47	19.65	19.83	20.00	20.18	20.36	20.53	20.71	20.89	21.06	21.24	21.42	21.59	21.77	21.95	22.12	22.30	22.48	22.65
137	18.22	18.40	18.58	18.75	18.93	19.11	19.28	19.46	19.64	19.81	19.99	20.17	20.34	20.52	20.70	20.87	21.05	21.23	21.40	21.58	21.76	21.93	22.11	22.28	22.46
136	18.03	18.21	18.39	18.56	18.74	18.92	19.09	19.27	19.45	19.62	19.80	19.98	20.15	20.33	20.51	20.68	20.86	21.03	21.21	21.39	21.56	21.74	21.92	22.09	22.27
135	17.84	18.02	18.20	18.37	18.55	18.73	18.90	19.08	19.26	19.43	19.61	19.78	19.96	20.14	20.31	20.49	20.67	20.84	21.02	21.20	21.37	21.55	21.73	21.90	22.08
134	17.65	17.83	18.00	18.18	18.36	18.53	18.71	18.89	19.06	19.24	19.42	19.59	19.77	19.95	20.12	20.30	20.48	20.65	20.83	21.01	21.18	21.36	21.54	21.71	21.89
133	17.46	17.64	17.81	17.99	18.17	18.34	18.52	18.70	18.87	19.05	19.23	19.40	19.58	19.76	19.93	20.11	20.29	20.46	20.64	20.82	20.99	21.17	21.35	21.52	21.70
132	17.27	17.45	17.62	17.80	17.98	18.15	18.33	18.51	18.68	18.86	19.04	19.21	19.39	19.57	19.74	19.92	20.10	20.27	20.45	20.63	20.80	20.98	21.16	21.33	21.51
131	17.08	17.26	17.43	17.61	17.79	17.96	18.14	18.32	18.49	18.67	18.85	19.02	19.20	19.38	19.55	19.73	19.91	20.08	20.26	20.44	20.61	20.79	20.96	21.14	21.32
130	16.89	17.07	17.24	17.42	17.60	17.77	17.95	18.13	18.30	18.48	18.66	18.83	19.01	19.18	19.36	19.54	19.71	19.89	20.07	20.24	20.42	20.60	20.77	20.95	21.13
129	16.70	16.88	17.05	17.23	17.41	17.58	17.76	17.93	18.11	18.29	18.46	18.64	18.82	18.99	19.17	19.35	19.52	19.70	19.88	20.05	20.23	20.41	20.58	20.76	20.94
128	16.51	16.68	16.86	17.04	17.21	17.39	17.57	17.74	17.92	18.10	18.27	18.45	18.63	18.80	18.98	19.16	19.33	19.51	19.69	19.86	20.04	20.22	20.39	20.57	20.75
127	16.32	16.49	16.67	16.85	17.02	17.20	17.38	17.55	17.73	17.91	18.08	18.26	18.44	18.61	18.79	18.97	19.14	19.32	19.50	19.67	19.85	20.03	20.20	20.38	20.56
126	16.13	16.30	16.48	16.66	16.83	17.01	17.19	17.36	17.54	17.72	17.89	18.07	18.25	18.42	18.60	18.78	18.95	19.13	19.31	19.48	19.66	19.84	20.01	20.19	20.36
125	15.94	16.11	16.29	16.47	16.64	16.82	17.00	17.17	17.35	17.53	17.70	17.88	18.06	18.23	18.41	18.59	18.76	18.94	19.11	19.29	19.47	19.64	19.82	20.00	20.17
124	15.75	15.92	16.10	16.28	16.45	16.63	16.81	16.98	17.16	17.34	17.51	17.69	17.86	18.04	18.22	18.39	18.57	18.75	18.92	19.10	19.28	19.45	19.63	19.81	19.98
123	15.56	15.73	15.91	16.08	16.26	16.44	16.61	16.79	16.97	17.14	17.32	17.50	17.67	17.85	18.03	18.20	18.38	18.56	18.73	18.91	19.09	19.26	19.44	19.62	19.79
122	15.36	15.54	15.72	15.89	16.07	16.25	16.42	16.60	16.78	16.95	17.13	17.31	17.48	17.66	17.84	18.01	18.19	18.37	18.54	18.72	18.90	19.07	19.25	19.43	19.60
121	15.17	15.35	15.53	15.70	15.88	16.06	16.23	16.41	16.59	16.76	16.94	17.12	17.29	17.47	17.65	17.82	18.00	18.18	18.35	18.53	18.71	18.88	19.06	19.24	19.41
120	14.98	15.16	15.34	15.51	15.69	15.87	16.04	16.22	16.40	16.57	16.75	16.93	17.10	17.28	17.46	17.63	17.81	17.99	18.16	18.34	18.52	18.69	18.87	19.04	19.22
119	14.79	14.97	15.15	15.32	15.50	15.68	15.85	16.03	16.21	16.38	16.56	16.74	16.91	17.09	17.26	17.44	17.62	17.79	17.97	18.15	18.32	18.50	18.68	18.85	19.03

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.059	.118
.1	.019	.078	.137
.2	.038	.097	.156
.3	.057	.116	.175
.4	.076	.135	.194
.5	.095	.154	.213
.6	.114	.173	.232
.7	.133	.192	.251
.8	.152	.211	.270
.9	.172	.230	.289

Table 33

Predicting Weight (Kilograms) of Boys, Age Nine Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																											
	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6
73	13.35	13.54	13.74	13.93	14.12	14.32	14.51	14.70	14.90	15.09	15.29	15.48	15.67	15.87	16.06	16.25	16.45	16.64	16.84	17.03	17.22	17.42	17.61	17.80	18.00	18.19	18.39	18.58
72	12.80	12.99	13.19	13.38	13.58	13.77	13.96	14.16	14.35	14.54	14.74	14.93	15.13	15.32	15.51	15.71	15.90	16.09	16.29	16.48	16.68	16.87	17.06	17.26	17.45	17.64	17.84	18.03
71	12.25	12.45	12.54	12.83	13.03	13.22	13.42	13.61	13.80	14.00	14.19	14.38	14.58	14.77	14.97	15.16	15.35	15.55	15.74	15.93	16.13	16.32	16.52	16.71	16.90	17.10	17.29	17.48
70	11.71	11.90	12.09	12.29	12.48	12.57	12.87	13.06	13.26	13.45	13.64	13.84	14.03	14.22	14.42	14.61	14.81	15.00	15.19	15.39	15.58	15.77	15.97	16.16	16.35	16.55	16.74	16.94
69	11.16	11.35	11.55	11.74	11.93	12.13	12.32	12.51	12.71	12.90	13.10	13.29	13.48	13.68	13.87	14.06	14.26	14.45	14.64	14.84	15.03	15.23	15.42	15.61	15.81	16.00	16.19	16.39
68	10.61	10.80	11.00	11.19	11.39	11.58	11.77	11.97	12.16	12.35	12.55	12.74	12.93	13.13	13.32	13.52	13.71	13.90	14.10	14.29	14.48	14.68	14.87	15.07	15.26	15.45	15.65	15.84
67	10.06	10.26	10.45	10.64	10.94	11.03	11.22	11.42	11.61	11.81	12.00	12.19	12.39	12.58	12.77	12.97	13.16	13.36	13.55	13.74	13.94	14.13	14.32	14.52	14.71	14.91	15.10	15.29
66	9.51	9.71	9.90	10.10	10.29	10.48	10.68	10.87	11.06	11.26	11.45	11.65	11.84	12.03	12.23	12.42	12.61	12.81	13.00	13.20	13.39	13.58	13.78	13.97	14.16	14.36	14.55	14.75
65	8.97	9.16	9.35	9.55	9.74	9.94	10.13	10.32	10.52	10.71	10.90	11.10	11.29	11.49	11.68	11.87	12.07	12.26	12.45	12.65	12.84	13.04	13.23	13.42	13.62	13.81	14.00	14.20
64	8.42	8.61	8.81	9.00	9.19	9.39	9.58	9.78	9.97	10.16	10.36	10.55	10.74	10.94	11.13	11.33	11.52	11.71	11.91	12.10	12.29	12.49	12.68	12.88	13.07	13.26	13.46	13.65
63	7.87	8.07	8.26	8.45	8.65	8.84	9.03	9.23	9.42	9.62	9.81	10.00	10.20	10.39	10.58	10.78	10.97	11.17	11.36	11.55	11.75	11.94	12.13	12.33	12.52	12.71	12.91	13.10
62	7.32	7.52	7.71	7.91	8.10	8.29	8.49	8.68	8.87	9.07	9.26	9.46	9.65	9.84	10.04	10.23	10.42	10.62	10.81	11.00	11.20	11.39	11.59	11.78	11.97	12.17	12.36	12.55
61	6.78	6.97	7.16	7.36	7.55	7.74	7.94	8.13	8.33	8.52	8.71	8.91	9.10	9.29	9.49	9.68	9.88	10.07	10.26	10.46	10.65	10.84	11.04	11.23	11.43	11.62	11.81	12.01
60	6.23	6.42	6.62	6.81	7.00	7.20	7.39	7.58	7.78	7.97	8.17	8.36	8.55	8.75	8.94	9.13	9.33	9.52	9.72	9.91	10.10	10.30	10.49	10.68	10.88	11.07	11.27	11.46
59	5.68	5.87	6.07	6.26	6.46	6.65	6.84	7.04	7.23	7.42	7.62	7.81	8.01	8.20	8.39	8.59	8.78	8.97	9.17	9.36	9.56	9.75	9.94	10.14	10.33	10.52	10.72	10.91
58	5.13	5.33	5.52	5.71	5.91	6.10	6.30	6.49	6.68	6.88	7.07	7.26	7.46	7.65	7.85	8.04	8.23	8.43	8.62	8.81	9.01	9.20	9.40	9.59	9.78	9.98	10.17	10.36
57	4.59	4.78	4.97	5.17	5.36	5.55	5.75	5.94	6.14	6.33	6.52	6.72	6.91	7.10	7.30	7.49	7.69	7.88	8.07	8.27	8.46	8.65	8.85	9.04	9.23	9.43	9.62	9.82
56	4.04	4.23	4.43	4.62	4.81	5.01	5.20	5.39	5.59	5.78	5.98	6.17	6.36	6.56	6.75	6.94	7.14	7.33	7.52	7.72	7.91	8.11	8.30	8.49	8.69	8.88	9.07	9.27
55	3.49	3.68	3.88	4.07	4.27	4.46	4.65	4.85	5.04	5.23	5.43	5.62	5.81	6.01	6.20	6.40	6.59	6.78	6.98	7.17	7.36	7.56	7.75	7.95	8.14	8.33	8.53	8.72
54	2.94	3.14	3.33	3.52	3.72	3.91	4.10	4.30	4.49	4.69	4.88	5.07	5.27	5.46	5.65	5.85	6.04	6.24	6.43	6.62	6.82	7.01	7.20	7.40	7.59	7.79	7.98	8.17
53	2.39	2.59	2.78	2.98	3.17	3.36	3.56	3.75	3.94	4.14	4.33	4.53	4.72	4.91	5.11	5.30	5.49	5.69	5.88	6.08	6.27	6.46	6.66	6.85	7.04	7.24	7.43	7.63

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.05
.2	.11
.3	.16
.4	.22
.5	.27
.6	.33
.7	.38
.8	.44
.9	.49

Table 34

Predicting Weight (Kilograms) of Boys, Age Ten Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																
	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0
159.0	19.13	19.27	19.41	19.54	19.68	19.82	19.96	20.09	20.23	20.37	20.50	20.64	20.78	20.92	21.05	21.19	21.33
157.5	18.80	18.94	19.08	19.22	19.35	19.49	19.63	19.77	19.90	20.04	20.18	20.31	20.45	20.59	20.73	20.86	21.00
156.0	18.48	18.61	18.75	18.89	19.03	19.16	19.30	19.44	19.57	19.71	19.85	19.99	20.12	20.26	20.40	20.53	20.67
154.5	18.15	18.29	18.42	18.56	18.70	18.84	18.97	19.11	19.25	19.38	19.52	19.66	19.80	19.93	20.07	20.21	20.34
153.0	17.82	17.96	18.10	18.23	18.37	18.51	18.65	18.78	18.92	19.06	19.19	19.33	19.47	19.61	19.74	19.88	20.02
151.5	17.50	17.63	17.77	17.91	18.04	18.18	18.32	18.46	18.59	18.73	18.87	19.00	19.14	19.28	19.42	19.55	19.69
150.0	17.17	17.30	17.44	17.58	17.72	17.85	17.99	18.13	18.26	18.40	18.54	18.68	18.81	18.95	19.09	19.22	19.36
148.5	16.84	16.98	17.11	17.25	17.39	17.53	17.66	17.80	17.94	18.07	18.21	18.35	18.49	18.62	18.76	18.90	19.03
147.0	16.51	16.65	16.79	16.92	17.06	17.20	17.34	17.47	17.61	17.75	17.88	18.02	18.16	18.30	18.43	18.57	18.71
145.5	16.19	16.32	16.46	16.60	16.73	16.87	17.01	17.15	17.28	17.42	17.56	17.69	17.83	17.97	18.11	18.24	18.38
144.0	15.86	16.00	16.13	16.27	16.41	16.54	16.68	16.82	16.96	17.09	17.23	17.37	17.50	17.64	17.78	17.92	18.05
142.5	15.53	15.67	15.80	15.94	16.08	16.22	16.35	16.49	16.63	16.76	16.90	17.04	17.18	17.31	17.45	17.59	17.72
141.0	15.20	15.34	15.48	15.61	15.75	15.89	16.03	16.16	16.30	16.44	16.57	16.71	16.85	16.99	17.12	17.26	17.40
139.5	14.88	15.01	15.15	15.29	15.42	15.56	15.70	15.84	15.97	16.11	16.25	16.38	16.52	16.66	16.80	16.93	17.07
138.0	14.55	14.69	14.82	14.96	15.10	15.23	15.37	15.51	15.65	15.78	15.92	16.06	16.19	16.33	16.47	16.61	16.74
136.5	14.22	14.36	14.49	14.63	14.77	14.91	15.04	15.18	15.32	15.46	15.59	15.73	15.87	16.00	16.14	16.28	16.42
135.0	13.89	14.03	14.17	14.30	14.44	14.58	14.72	14.85	14.99	15.13	15.26	15.40	15.54	15.68	15.81	15.95	16.09
133.5	13.57	13.70	13.84	13.98	14.11	14.25	14.39	14.53	14.66	14.80	14.94	15.07	15.21	15.35	15.49	15.62	15.76
132.0	13.24	13.38	13.51	13.65	13.79	13.92	14.06	14.20	14.34	14.47	14.61	14.75	14.88	15.02	15.16	15.30	15.43
130.5	12.91	13.05	13.19	13.32	13.46	13.60	13.73	13.87	14.01	14.15	14.28	14.42	14.56	14.69	14.83	14.97	15.11
129.0	12.58	12.72	12.86	12.99	13.13	13.27	13.41	13.54	13.68	13.82	13.95	14.09	14.23	14.37	14.50	14.64	14.78
127.5	12.26	12.39	12.53	12.67	12.80	12.94	13.08	13.22	13.35	13.49	13.63	13.76	13.90	14.04	14.18	14.31	14.45
126.0	11.93	12.07	12.20	12.34	12.48	12.61	12.75	12.89	13.03	13.16	13.30	13.44	13.57	13.71	13.85	13.99	14.12
124.5	11.60	11.74	11.88	12.01	12.15	12.29	12.42	12.56	12.70	12.84	12.97	13.11	13.25	13.38	13.52	13.66	13.80
123.0	11.27	11.41	11.55	11.69	11.82	11.96	12.10	12.23	12.37	12.51	12.65	12.78	12.92	13.06	13.19	13.33	13.47
121.5	10.95	11.08	11.22	11.36	11.49	11.63	11.77	11.91	12.04	12.18	12.32	12.45	12.59	12.73	13.87	13.00	13.14
120.0	10.62	10.76	10.89	11.03	11.17	11.30	11.44	11.58	11.72	11.85	11.99	12.13	12.26	12.40	12.54	12.68	12.81
118.5	10.29	10.43	10.57	10.70	10.84	10.98	11.11	11.25	11.39	11.53	11.66	11.80	11.94	12.07	12.21	12.35	12.49
117.0	9.96	10.10	10.24	10.38	10.51	10.65	10.79	10.92	11.06	11.20	11.34	11.47	11.61	11.75	11.88	12.02	12.16

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.03	.05	.08	.11
.1	.02	.05	.08	.10	.13
.2	.04	.07	.10	.13	.15
.3	.07	.09	.12	.15	.18
.4	.09	.11	.14	.17	.20
.5	.11	.14	.16	.19	.22
.6	.13	.16	.19	.21	.24
.7	.15	.18	.21	.23	.26
.8	.17	.20	.23	.26	.28
.9	.20	.22	.25	.28	.31
1.0	.22	.25	.27	.30	.33
1.1	.24	.27	.29	.32	.35
1.2	.26	.29	.32	.34	.37
1.3	.28	.31	.34	.37	.39
1.4	.31	.33	.36	.39	.41

Table 35

Predicting Weight (Kilograms) of Boys, Age Ten Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																	
	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2
76	22.16	22.59	23.02	23.45	23.88	24.31	24.74	25.16	25.59	26.02	26.45	26.88	27.31	27.74	28.17	28.59	29.02	29.45
75	21.41	21.83	22.26	22.69	23.12	23.55	23.98	24.41	24.84	25.26	25.69	26.12	26.55	26.98	27.41	27.84	28.27	28.69
74	20.65	21.08	21.51	21.93	22.36	22.79	23.22	23.65	24.08	24.51	24.94	25.36	25.79	26.22	26.65	27.08	27.51	27.94
73	19.89	20.32	20.75	21.18	21.60	22.03	22.46	22.89	23.32	23.75	24.18	24.61	25.04	25.46	25.89	26.32	26.75	27.18
72	19.13	19.56	19.99	20.42	20.85	21.28	21.70	22.13	22.56	22.99	23.42	23.85	24.28	24.71	25.13	25.56	25.99	26.42
71	18.37	18.80	19.23	19.66	20.09	20.52	20.95	21.38	21.80	22.23	22.66	23.09	23.52	23.95	24.38	24.81	25.23	25.66
70	17.62	18.05	18.47	18.90	19.33	19.76	20.19	20.62	21.05	21.48	21.90	22.33	22.76	23.19	23.62	24.05	24.48	24.91
69	16.86	17.29	17.72	18.15	18.57	19.00	19.43	19.86	20.29	20.72	21.15	21.58	22.00	22.43	22.86	23.29	23.72	24.15
68	16.10	16.53	16.96	17.39	17.82	18.25	18.67	19.10	19.53	19.96	20.39	20.82	21.25	21.68	22.10	22.53	22.96	23.39
67	15.34	15.77	16.20	16.63	17.06	17.49	17.92	18.35	18.77	19.20	19.63	20.06	20.49	20.92	21.35	21.78	22.20	22.63
66	14.59	15.01	15.44	15.87	16.30	16.73	17.16	17.59	18.02	18.44	18.87	19.30	19.73	20.16	20.59	21.02	21.45	21.87
65	13.83	14.26	14.69	15.11	15.54	15.97	16.40	16.83	17.26	17.69	18.12	18.54	18.97	19.40	19.83	20.26	20.69	21.12
64	13.07	13.50	13.93	14.36	14.79	15.21	15.64	16.07	16.50	16.93	17.36	17.79	18.22	18.64	19.07	19.50	19.93	20.36
63	12.31	12.74	13.17	13.60	14.03	14.46	14.89	15.31	15.74	16.17	16.60	17.03	17.46	17.89	18.32	18.74	19.17	19.60
62	11.56	11.98	12.41	12.84	13.27	13.70	14.13	14.56	14.99	15.41	15.84	16.27	16.70	17.13	17.56	17.99	18.42	18.84
61	10.80	11.23	11.66	12.08	12.51	12.94	13.37	13.80	14.23	14.66	15.09	15.51	15.94	16.37	16.80	17.23	17.66	18.09
60	10.04	10.47	10.90	11.33	11.75	12.18	12.61	13.04	13.47	13.90	14.33	14.76	15.18	15.61	16.04	16.47	16.90	17.33
59	9.28	9.71	10.14	10.57	11.00	11.43	11.85	12.28	12.71	13.14	13.57	14.00	14.43	14.86	15.28	15.71	16.14	16.57
58	8.52	8.95	9.38	9.81	10.24	10.67	11.10	11.53	11.95	12.38	12.81	13.24	13.67	14.10	14.53	14.96	15.38	15.81
57	7.77	8.20	8.62	9.05	9.48	9.91	10.34	10.77	11.20	11.63	12.05	12.48	12.91	13.34	13.77	14.20	14.63	15.06
56	7.01	7.44	7.87	8.30	8.72	9.15	9.58	10.01	10.44	10.87	11.30	11.73	12.15	12.58	13.01	13.44	13.87	14.30
55	6.25	6.68	7.11	7.54	7.97	8.40	8.82	9.25	9.68	10.11	10.54	10.97	11.40	11.83	12.25	12.68	13.11	13.54
54	5.49	5.92	6.35	6.78	7.21	7.64	8.07	8.49	8.92	9.35	9.78	10.21	10.64	11.07	11.50	11.93	12.35	12.78

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.214
.1	.076	.290
.2	.152	.366
.3	.227	.442
.4	.303	.517
.5	.379	.593
.6	.455	.669
.7	.530	.745
.8	.606	.821
.9	.682	.896

Table 36

Predicting Weight (Kilograms) of Boys, Age Eleven Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																			
	18.8	19.2	19.6	20.0	20.4	20.8	21.2	21.6	22.0	22.4	22.8	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4
160	24.24	24.32	24.40	24.48	24.55	24.63	24.71	24.79	24.86	24.94	25.02	25.10	25.17	25.25	25.33	25.40	25.48	25.56	25.64	25.71
159	24.01	24.09	24.17	24.25	24.32	24.40	24.48	24.56	24.63	24.71	24.79	24.87	24.94	25.02	25.10	25.18	25.25	25.33	25.41	25.48
158	23.79	23.86	23.94	24.02	24.09	24.17	24.25	24.33	24.40	24.48	24.56	24.64	24.71	24.79	24.87	24.95	25.02	25.10	25.18	25.25
157	23.56	23.63	23.71	23.79	23.86	23.94	24.02	24.10	24.17	24.25	24.33	24.41	24.48	24.56	24.64	24.72	24.79	24.87	24.95	25.03
156	23.33	23.40	23.48	23.56	23.64	23.71	23.79	23.87	23.94	24.02	24.10	24.18	24.25	24.33	24.41	24.49	24.56	24.64	24.72	24.80
155	23.10	23.17	23.25	23.33	23.41	23.48	23.56	23.64	23.71	23.79	23.87	23.95	24.02	24.10	24.18	24.26	24.33	24.41	24.49	24.57
154	22.87	22.94	23.02	23.10	23.18	23.25	23.33	23.41	23.49	23.56	23.64	23.72	23.79	23.87	23.95	24.03	24.10	24.18	24.26	24.34
153	22.64	22.71	22.79	22.87	22.95	23.02	23.10	23.18	23.26	23.33	23.41	23.49	23.56	23.64	23.72	23.80	23.87	23.95	24.03	24.11
152	22.41	22.48	22.56	22.64	22.72	22.79	22.87	22.95	23.03	23.10	23.18	23.26	23.34	23.41	23.49	23.57	23.64	23.72	23.80	23.88
151	22.18	22.25	22.33	22.41	22.49	22.56	22.64	22.72	22.80	22.87	22.95	23.03	23.11	23.18	23.26	23.34	23.41	23.49	23.57	23.65
150	21.95	22.02	22.10	22.18	22.26	22.33	22.41	22.49	22.57	22.64	22.72	22.80	22.88	22.95	23.03	23.11	23.19	23.26	23.34	23.42
149	21.72	21.80	21.87	21.95	22.03	22.10	22.18	22.26	22.34	22.41	22.49	22.57	22.65	22.72	22.80	22.88	22.96	23.03	23.11	23.19
148	21.49	21.57	21.64	21.72	21.80	21.87	21.95	22.03	22.11	22.18	22.26	22.34	22.42	22.49	22.57	22.65	22.73	22.80	22.88	22.96
147	21.26	21.34	21.41	21.49	21.57	21.65	21.72	21.80	21.88	21.95	22.03	22.11	22.19	22.26	22.34	22.42	22.50	22.57	22.65	22.73
146	21.03	21.11	21.18	21.26	21.34	21.42	21.49	21.57	21.65	21.72	21.80	21.88	21.96	22.03	22.11	22.19	22.27	22.34	22.42	22.50
145	20.80	20.88	20.95	21.03	21.11	21.19	21.26	21.34	21.42	21.50	21.57	21.65	21.73	21.80	21.88	21.96	22.04	22.11	22.19	22.27
144	20.57	20.65	20.72	20.80	20.88	20.96	21.03	21.11	21.19	21.27	21.34	21.42	21.50	21.58	21.65	21.73	21.81	21.88	21.96	22.04
143	20.34	20.42	20.49	20.57	20.65	20.73	20.80	20.88	20.96	21.04	21.11	21.19	21.27	21.35	21.42	21.50	21.58	21.65	21.73	21.81
142	20.11	20.19	20.26	20.34	20.42	20.50	20.57	20.65	20.73	20.81	20.88	20.96	21.04	21.12	21.19	21.27	21.35	21.43	21.50	21.58
141	19.88	19.96	20.03	20.11	20.19	20.27	20.34	20.42	20.50	20.58	20.65	20.73	20.81	20.89	20.96	21.04	21.12	21.20	21.27	21.35
140	19.65	19.73	19.81	19.88	19.96	20.04	20.11	20.19	20.27	20.35	20.42	20.50	20.58	20.66	20.73	20.81	20.89	20.97	21.04	21.12
139	19.42	19.50	19.58	19.65	19.73	19.81	19.88	19.96	20.04	20.12	20.19	20.27	20.35	20.43	20.50	20.58	20.66	20.74	20.81	20.89
138	19.19	19.27	19.35	19.42	19.50	19.58	19.66	19.73	19.81	19.89	19.96	20.04	20.12	20.20	20.27	20.35	20.43	20.51	20.58	20.66
137	18.96	19.04	19.12	19.19	19.27	19.35	19.43	19.50	19.58	19.66	19.74	19.81	19.89	19.97	20.04	20.12	20.20	20.28	20.35	20.43
136	18.73	18.81	18.89	18.96	19.04	19.12	19.20	19.27	19.35	19.43	19.51	19.58	19.66	19.74	19.81	19.89	19.97	20.05	20.12	20.20
135	18.50	18.58	18.66	18.73	18.81	18.89	18.97	19.04	19.12	19.20	19.28	19.35	19.43	19.51	19.59	19.66	19.74	19.82	19.89	19.97
134	18.27	18.35	18.43	18.50	18.58	18.66	18.74	18.81	18.89	18.97	19.05	19.12	19.20	19.28	19.36	19.43	19.51	19.59	19.66	19.74
133	18.04	18.12	18.20	18.27	18.35	18.43	18.51	18.58	18.66	18.74	18.82	18.89	18.97	19.05	19.13	19.20	19.28	19.36	19.44	19.51
132	17.81	17.89	17.97	18.05	18.12	18.20	18.28	18.35	18.43	18.51	18.59	18.66	18.74	18.82	18.90	18.97	19.05	19.13	19.21	19.28
131	17.58	17.66	17.74	17.82	17.89	17.97	18.05	18.12	18.20	18.28	18.36	18.43	18.51	18.59	18.67	18.74	18.82	18.90	18.98	19.05
130	17.35	17.43	17.51	17.59	17.66	17.74	17.82	17.90	17.97	18.05	18.13	18.20	18.28	18.36	18.44	18.51	18.59	18.67	18.75	18.82
129	17.12	17.20	17.28	17.36	17.43	17.51	17.59	17.67	17.74	17.82	17.90	17.97	18.05	18.13	18.21	18.28	18.36	18.44	18.52	18.59
128	16.89	16.97	17.05	17.13	17.20	17.28	17.36	17.44	17.51	17.59	17.67	17.75	17.82	17.90	17.98	18.05	18.13	18.21	18.29	18.36
127	16.66	16.74	16.82	16.90	16.97	17.05	17.13	17.21	17.28	17.36	17.44	17.52	17.59	17.67	17.75	17.82	17.90	17.98	18.06	18.13
126	16.43	16.51	16.59	16.67	16.74	16.82	16.90	16.98	17.05	17.13	17.21	17.29	17.36	17.44	17.52	17.60	17.67	17.75	17.83	17.90

Interpolation Table

Height	Hips			
	0	.1	.2	.3
0	0	.02	.04	.06
.1	.02	.04	.06	.08
.2	.05	.07	.08	.10
.3	.07	.09	.11	.13
.4	.09	.11	.13	.15
.5	.11	.13	.15	.17
.6	.14	.16	.18	.20
.7	.16	.18	.20	.22
.8	.18	.20	.22	.24
.9	.21	.23	.25	.26

Table 37

Predicting Weight (Kilograms) of Boys, Age Eleven Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																
	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2
77	14.99	15.61	16.23	16.85	17.47	18.09	18.71	19.34	19.96	20.58	21.20	21.82	22.44	23.06	23.69	24.31	24.93
76	14.42	15.05	15.67	16.29	16.91	17.53	18.15	18.77	19.40	20.02	20.64	21.26	21.88	22.50	23.12	23.75	24.37
75	13.86	14.48	15.11	15.73	16.35	16.97	17.59	18.21	18.83	19.46	20.08	20.70	21.32	21.94	22.56	23.18	23.81
74	13.30	13.92	14.54	15.17	15.79	16.41	17.03	17.65	18.27	18.89	19.52	20.14	20.76	21.38	22.00	22.62	23.24
73	12.74	13.36	13.98	14.60	15.23	15.85	16.47	17.09	17.71	18.33	18.95	19.58	20.20	20.82	21.44	22.06	22.68
72	12.18	12.80	13.42	14.04	14.66	15.29	15.91	16.53	17.15	17.77	18.39	19.01	19.64	20.26	20.88	21.50	22.12
71	11.62	12.24	12.86	13.48	14.10	14.72	15.35	15.97	16.59	17.21	17.83	18.45	19.07	19.70	20.32	20.94	21.56
70	11.06	11.68	12.30	12.92	13.54	14.16	14.78	15.41	16.03	16.65	17.27	17.89	18.51	19.13	19.76	20.38	21.00
69	10.49	11.12	11.74	12.36	12.98	13.60	14.22	14.84	15.47	16.09	16.71	17.33	17.95	18.57	19.19	19.82	20.44
68	9.93	10.55	11.18	11.80	12.42	13.04	13.66	14.28	14.90	15.53	16.15	16.77	17.39	18.01	18.63	19.25	19.88
67	9.37	9.99	10.61	11.24	11.86	12.48	13.10	13.72	14.34	14.96	15.59	16.21	16.83	17.45	18.07	18.69	19.31
66	8.81	9.43	10.05	10.67	11.30	11.92	12.54	13.16	13.78	14.40	15.02	15.65	16.27	16.89	17.51	18.13	18.75
65	8.25	8.87	9.49	10.11	10.73	11.36	11.98	12.60	13.22	13.84	14.46	15.08	15.71	16.33	16.95	17.57	18.19
64	7.69	8.31	8.93	9.55	10.17	10.79	11.42	12.04	12.66	13.28	13.90	14.52	15.14	15.77	16.39	17.01	17.63
63	7.12	7.75	8.37	8.99	9.61	10.23	10.85	11.47	12.10	12.72	13.34	13.96	14.58	15.20	15.83	16.45	17.07
62	6.56	7.18	7.81	8.43	9.05	9.67	10.29	10.91	11.53	12.16	12.78	13.40	14.02	14.64	15.26	15.89	16.51
61	6.00	6.62	7.24	7.87	8.49	9.11	9.73	10.35	10.97	11.59	12.22	12.84	13.46	14.08	14.70	15.32	15.94
60	5.44	6.06	6.68	7.30	7.93	8.55	9.17	9.79	10.41	11.03	11.65	12.28	12.90	13.52	14.14	14.76	15.38
59	4.88	5.50	6.12	6.74	7.36	7.99	8.61	9.23	9.85	10.47	11.09	11.71	12.34	12.96	13.58	14.20	14.82
58	4.32	4.94	5.56	6.18	6.80	7.42	8.05	8.67	9.29	9.91	10.53	11.15	11.77	12.40	13.02	13.64	14.26
57	3.76	4.38	5.00	5.62	6.24	6.86	7.48	8.11	8.73	9.35	9.97	10.59	11.21	11.83	12.46	13.08	13.70
56	3.19	3.82	4.44	5.06	5.68	6.30	6.92	7.54	8.17	8.79	9.41	10.03	10.65	11.27	11.89	12.52	13.14

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.311
.1	.056	.367
.2	.112	.423
.3	.168	.479
.4	.225	.535
.5	.281	.591
.6	.337	.648
.7	.393	.704
.8	.449	.760
.9	.505	.816

Table 38

Predicting Weight (Kilograms) of Boys, Age Twelve Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																		
	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0
170	22.82	22.94	23.07	23.19	23.31	23.44	23.56	23.68	23.80	23.93	24.05	24.17	24.30	24.42	24.54	24.66	24.79	24.91	25.03
168	22.38	22.50	22.62	22.74	22.87	22.99	23.11	23.24	23.36	23.48	23.60	23.73	23.85	23.97	24.10	24.22	24.34	24.46	24.59
166	21.93	22.05	22.18	22.30	22.42	22.54	22.67	22.79	22.91	23.04	23.16	23.28	23.40	23.53	23.64	23.77	23.90	24.02	24.14
164	21.48	21.61	21.73	21.85	21.97	22.10	22.22	22.34	22.47	22.59	22.71	22.83	22.96	23.08	23.20	23.33	23.45	23.57	23.69
162	21.04	21.16	21.28	21.41	21.53	21.65	21.77	21.90	22.02	22.14	22.27	22.39	22.51	22.63	22.76	22.88	23.00	23.13	23.25
160	20.59	20.71	20.84	20.96	21.08	21.21	21.33	21.45	21.57	21.70	21.82	21.94	22.07	22.19	22.31	22.43	22.56	22.68	22.80
158	20.15	20.27	20.39	20.51	20.64	20.76	20.88	21.01	21.13	21.25	21.37	21.50	21.62	21.74	21.87	21.99	22.11	22.23	22.36
156	19.70	19.82	19.95	20.07	20.19	20.31	20.44	20.56	20.68	20.81	20.93	21.05	21.17	21.30	21.42	21.54	21.67	21.79	21.91
154	19.25	19.38	19.50	19.62	19.74	19.87	19.99	20.11	20.24	20.36	20.48	20.60	20.73	20.85	20.97	21.10	21.22	21.34	21.46
152	18.81	18.93	19.05	19.18	19.30	19.42	19.54	19.67	19.79	19.91	20.04	20.16	20.28	20.40	20.53	20.65	20.77	20.90	21.02
150	18.36	18.48	18.61	18.73	18.85	18.98	19.10	19.22	19.34	19.47	19.59	19.71	19.84	19.96	20.08	20.20	20.33	20.45	20.57
148	17.92	18.04	18.16	18.28	18.41	18.53	18.65	18.78	18.90	19.02	19.14	19.27	19.39	19.51	19.64	19.76	19.88	20.00	20.13
146	17.47	17.59	17.72	17.84	17.96	18.08	18.21	18.33	18.45	18.58	18.70	18.82	18.94	19.07	19.19	19.31	19.44	19.56	19.68
144	17.02	17.15	17.27	17.39	17.51	17.64	17.76	17.88	18.01	18.13	18.25	18.37	18.50	18.62	18.74	18.97	18.99	19.11	19.23
142	16.58	16.70	16.82	16.95	17.07	17.19	17.31	17.44	17.56	17.68	17.81	17.93	18.05	18.17	18.30	18.42	18.54	18.67	18.79
140	16.13	16.25	16.38	16.50	16.62	16.75	16.87	16.99	17.11	17.24	17.36	17.48	17.61	17.73	17.85	17.97	18.10	18.22	18.34
138	15.69	15.81	15.93	16.05	16.18	16.30	16.42	16.55	16.67	16.79	16.91	17.04	17.16	17.28	17.41	17.53	17.65	17.77	17.90
136	15.24	15.36	15.49	15.61	15.73	15.85	15.98	16.10	16.22	16.35	16.47	16.59	16.71	16.84	16.96	17.08	17.21	17.33	17.45
134	14.79	14.92	15.04	15.16	15.28	15.41	15.53	15.65	15.78	15.90	16.02	16.14	16.27	16.39	16.51	16.64	16.76	16.88	17.00
132	14.35	14.47	14.59	14.72	14.84	14.96	15.08	15.21	15.33	15.45	15.58	15.70	15.82	15.94	16.07	16.19	16.31	16.44	16.56
130	13.90	14.02	14.15	14.27	14.39	14.52	14.64	14.76	14.88	15.01	15.13	15.25	15.38	15.50	15.62	15.74	15.87	15.99	16.11
128	13.46	13.58	13.70	13.82	13.95	14.07	14.19	14.32	14.44	14.56	14.68	14.81	14.93	15.05	15.18	15.30	15.42	15.54	15.67

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.025	.049	.074	.098
.1	.022	.047	.071	.096	.121
.2	.045	.069	.094	.118	.143
.3	.067	.091	.116	.141	.165
.4	.089	.114	.138	.163	.187
.5	.112	.136	.161	.185	.210
.6	.134	.158	.183	.208	.232
.7	.156	.181	.205	.230	.254
.8	.178	.203	.228	.252	.277
.9	.201	.225	.250	.274	.299
1.0	.223	.248	.272	.297	.321
1.1	.245	.270	.294	.319	.344
1.2	.268	.292	.317	.341	.366
1.3	.290	.314	.339	.364	.388
1.4	.312	.337	.361	.386	.410
1.5	.335	.359	.384	.408	.433
1.6	.357	.381	.406	.431	.455
1.7	.379	.404	.428	.453	.477
1.8	.401	.426	.451	.475	.500
1.9	.424	.448	.473	.497	.522

Table 39

Predicting Weight (Kilograms) of Boys, Age Twelve Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																															
	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4
81	19.69	20.07	20.45	20.82	21.20	21.58	21.96	22.33	22.71	23.09	23.47	23.84	24.22	24.60	24.97	25.35	25.73	26.11	26.48	26.86	27.24	27.62	27.99	28.37	28.75	29.12	29.50	29.88	30.26	30.63	31.01	31.39
80	19.17	19.55	19.93	20.30	20.68	21.06	21.44	21.81	22.19	22.57	22.95	23.32	23.70	24.08	24.45	24.83	25.21	25.59	25.96	26.34	26.72	27.10	27.47	27.85	28.23	28.60	28.98	29.36	29.74	30.11	30.49	30.87
79	18.65	19.03	19.41	19.78	20.16	20.54	20.92	21.29	21.67	22.05	22.43	22.80	23.18	23.56	23.93	24.31	24.69	25.07	25.44	25.82	26.20	26.57	26.95	27.33	27.71	28.08	28.46	28.84	29.22	29.59	29.97	30.35
78	18.13	18.51	18.89	19.26	19.64	20.02	20.40	20.77	21.15	21.53	21.90	22.28	22.66	23.04	23.41	23.79	24.17	24.55	24.92	25.30	25.68	26.05	26.43	26.81	27.19	27.56	27.94	28.32	28.70	29.07	29.45	29.83
77	17.61	17.99	18.37	18.74	19.12	19.50	19.88	20.25	20.63	21.01	21.38	21.76	22.14	22.52	22.89	23.27	23.65	24.03	24.40	24.78	25.16	25.53	25.91	26.29	26.67	27.04	27.42	27.80	28.18	28.55	28.93	29.31
76	17.09	17.47	17.85	18.22	18.60	18.98	19.35	19.73	20.11	20.49	20.86	21.24	21.62	22.00	22.37	22.75	23.13	23.50	23.88	24.26	24.64	25.01	25.39	25.77	26.15	26.52	26.90	27.28	27.65	28.03	28.41	28.79
75	16.57	16.95	17.33	17.70	18.08	18.46	18.83	19.21	19.59	19.97	20.34	20.72	21.10	21.48	21.85	22.23	22.61	22.98	23.36	23.74	24.12	24.49	24.87	25.25	25.63	26.00	26.38	26.76	27.13	27.51	27.89	28.27
74	16.05	16.43	16.80	17.18	17.56	17.94	18.31	18.69	19.07	19.45	19.82	20.20	20.58	20.95	21.33	21.71	22.09	22.46	22.84	23.22	23.60	23.97	24.35	24.73	25.10	25.48	25.86	26.24	26.61	26.99	27.37	27.75
73	15.53	15.91	16.28	16.66	17.04	17.42	17.79	18.17	18.55	18.93	19.30	19.68	20.06	20.43	20.81	21.19	21.57	21.94	22.32	22.70	23.08	23.45	23.83	24.21	24.58	24.96	25.34	25.72	26.09	26.47	26.85	27.23
72	15.01	15.39	15.76	16.14	16.52	16.90	17.27	17.65	18.03	18.40	18.78	19.16	19.54	19.91	20.29	20.67	21.05	21.42	21.80	22.18	22.55	22.93	23.31	23.69	24.06	24.44	24.82	25.20	25.57	25.95	26.33	26.70
71	14.49	14.87	15.24	15.62	16.00	16.38	16.75	17.13	17.51	17.88	18.26	18.64	19.02	19.39	19.77	20.15	20.53	20.90	21.28	21.66	22.03	22.41	22.79	23.17	23.54	23.92	24.30	24.68	25.05	25.43	25.81	26.18
70	13.97	14.35	14.72	15.10	15.48	15.86	16.23	16.61	16.99	17.36	17.74	18.12	18.50	18.87	19.25	19.63	20.01	20.38	20.76	21.14	21.51	21.89	22.27	22.65	23.02	23.40	23.78	24.16	24.53	24.91	25.29	25.66
69	13.45	13.83	14.20	14.58	14.96	15.33	15.71	16.09	16.47	16.84	17.22	17.60	17.98	18.35	18.73	19.11	19.48	19.86	20.24	20.62	20.99	21.37	21.75	22.13	22.50	22.88	23.26	23.63	24.01	24.39	24.77	25.14
68	12.93	13.31	13.68	14.06	14.44	14.81	15.19	15.57	15.95	16.32	16.70	17.08	17.46	17.83	18.21	18.59	18.96	19.34	19.72	20.10	20.47	20.85	21.23	21.61	21.98	22.36	22.74	23.11	23.49	23.87	24.25	24.62
67	12.41	12.79	13.16	13.54	13.92	14.29	14.67	15.05	15.43	15.80	16.18	16.56	16.93	17.31	17.69	18.07	18.44	18.82	19.20	19.58	19.95	20.33	20.71	21.08	21.46	21.84	22.22	22.59	22.97	23.35	23.73	24.10
66	11.89	12.26	12.64	13.02	13.40	13.77	14.15	14.53	14.91	15.28	15.66	16.04	16.41	16.79	17.17	17.55	17.92	18.30	18.68	19.06	19.43	19.81	20.19	20.56	20.94	21.32	21.70	22.07	22.45	22.83	23.21	23.58
65	11.37	11.74	12.12	12.50	12.88	13.25	13.63	14.01	14.38	14.76	15.14	15.52	15.89	16.27	16.65	17.03	17.40	17.78	18.16	18.53	18.91	19.29	19.67	20.04	20.42	20.80	21.18	21.55	21.93	22.31	22.68	23.06
64	10.85	11.22	11.60	11.98	12.36	12.73	13.11	13.49	13.86	14.24	14.62	15.00	15.37	15.75	16.13	16.51	16.88	17.26	17.64	18.01	18.39	18.77	19.15	19.52	19.90	20.28	20.66	21.03	21.41	21.79	22.16	22.54
63	10.33	10.70	11.08	11.46	11.83	12.21	12.59	12.97	13.34	13.72	14.10	14.48	14.85	15.23	15.61	15.98	16.36	16.74	17.12	17.49	17.87	18.25	18.63	19.00	19.38	19.76	20.13	20.51	20.89	21.27	21.64	22.02
62	9.81	10.18	10.56	10.94	11.31	11.69	12.07	12.45	12.82	13.20	13.58	13.96	14.33	14.71	15.09	15.46	15.84	16.22	16.60	16.97	17.35	17.73	18.11	18.48	18.86	19.24	19.61	19.99	20.37	20.75	21.12	21.50
61	9.29	9.66	10.04	10.42	10.79	11.17	11.55	11.93	12.30	12.68	13.06	13.44	13.81	14.19	14.57	14.94	15.32	15.70	16.08	16.45	16.83	17.21	17.59	17.96	18.34	18.72	19.09	19.47	19.85	20.23	20.60	20.98
60	8.76	9.14	9.52	9.90	10.27	10.65	11.03	11.41	11.78	12.16	12.54	12.91	13.29	13.67	14.05	14.42	14.80	15.18	15.56	15.93	16.31	16.69	17.06	17.44	17.82	18.20	18.57	18.95	19.33	19.71	20.08	20.46
59	8.24	8.62	9.00	9.38	9.75	10.13	10.51	10.89	11.26	11.64	12.02	12.39	12.77	13.15	13.53	13.90	14.28	14.66	15.04	15.41	15.79	16.17	16.54	16.92	17.30	17.68	18.05	18.43	18.81	19.19	19.56	19.94
58	7.72	8.10	8.48	8.86	9.23	9.61	9.99	10.36	10.74	11.12	11.50	11.87	12.25	12.63	13.01	13.38	13.76	14.14	14.51	14.89	15.27	15.65	16.02	16.40	16.78	17.16	17.53	17.91	18.29	18.66	19.04	19.42
57	7.20	7.58	7.96	8.34	8.71	9.09	9.47	9.84	10.22	10.60	10.98	11.35	11.73	12.11	12.49	12.86	13.24	13.62	13.99	14.37	14.75	15.13	15.50	15.88	16.26	16.64	17.01	17.39	17.77	18.14	18.52	18.90
56	6.68	7.06	7.44	7.81	8.19	8.57	8.95	9.32	9.70	10.08	10.46	10.83	11.21	11.59	11.96	12.34	12.72	13.10	13.47	13.85	14.23	14.61	14.98	15.36	15.74	16.11	16.49	16.87	17.25	17.62	18.00	18.38
55	6.16	6.54	6.92	7.29	7.67	8.05	8.43	8.80	9.18	9.56	9.94	10.31	10.69	11.07	11.44	11.82	12.20	12.58	12.95	13.33	13.71	14.09	14.46	14.84	15.22	15.59	15.97	16.35	16.73	17.10	17.48	17.86

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.05
.2	.10
.3	.16
.4	.21
.5	.26
.6	.31
.7	.36
.8	.42
.9	.47

Table 40

Predicting Weight (Kilograms) of Boys, Age Thirteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																							
	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5
182	33.13	33.17	33.21	33.25	33.29	33.33	33.37	33.41	33.45	33.49	33.53	33.57	33.61	33.65	33.70	33.74	33.78	33.82	33.86	33.90	33.94	33.98	34.02	34.06
180	32.63	32.67	32.71	32.75	32.79	32.83	32.88	32.92	32.96	33.00	33.04	33.08	33.12	33.16	33.20	33.24	33.28	33.32	33.36	33.40	33.44	33.48	33.53	33.57
178	32.14	32.18	32.22	32.26	32.30	32.34	32.38	32.42	32.46	32.50	32.54	32.58	32.62	32.66	32.71	32.75	32.79	32.83	32.87	32.91	32.95	32.99	33.03	33.07
176	31.64	31.68	31.72	31.76	31.80	31.84	31.89	31.93	31.97	32.01	32.05	32.09	32.13	32.17	32.21	32.25	32.29	32.33	32.37	32.41	32.45	32.49	32.53	32.58
174	31.15	31.19	31.23	31.27	31.31	31.35	31.39	31.43	31.47	31.51	31.55	31.59	31.63	31.67	31.71	31.76	31.80	31.84	31.88	31.92	31.96	32.00	32.04	32.08
172	30.65	30.69	30.73	30.77	30.81	30.85	30.89	30.94	30.98	31.02	31.06	31.10	31.14	31.18	31.22	31.26	31.30	31.34	31.38	31.42	31.46	31.50	31.54	31.58
170	30.16	30.20	30.24	30.28	30.32	30.36	30.40	30.44	30.48	30.52	30.56	30.60	30.64	30.68	30.72	30.76	30.81	30.85	30.89	30.93	30.97	31.01	31.05	31.09
168	29.66	29.70	29.74	29.78	29.82	29.86	29.90	29.94	29.99	30.03	30.07	30.11	30.15	30.19	30.23	30.27	30.31	30.35	30.39	30.43	30.47	30.51	30.55	30.59
166	29.17	29.21	29.25	29.29	29.33	29.37	29.41	29.45	29.49	29.53	29.57	29.61	29.65	29.69	29.73	29.77	29.82	29.86	29.90	29.94	29.98	30.02	30.06	30.10
164	28.67	28.71	28.75	28.79	28.83	28.87	28.91	28.95	29.00	29.04	29.08	29.12	29.16	29.20	29.24	29.28	29.32	29.36	29.40	29.44	29.48	29.52	29.56	29.60
162	28.18	28.22	28.26	28.30	28.34	28.38	28.42	28.46	28.50	28.54	28.58	28.62	28.66	28.70	28.74	28.78	28.82	28.87	28.91	28.95	28.99	29.03	29.07	29.11
160	27.68	27.72	27.76	27.80	27.84	27.88	27.92	27.96	28.00	28.05	28.09	28.13	28.17	28.21	28.25	28.29	28.33	28.37	28.41	28.45	28.49	28.53	28.57	28.61
158	27.18	27.23	27.27	27.31	27.35	27.39	27.43	27.47	27.51	27.55	27.59	27.63	27.67	27.71	27.75	27.79	27.83	27.87	27.92	27.96	28.00	28.04	28.08	28.12
156	26.69	26.73	26.77	26.81	26.85	26.89	26.93	26.97	27.01	27.05	27.10	27.14	27.18	27.22	27.26	27.30	27.34	27.38	27.42	27.46	27.50	27.54	27.58	27.62
154	26.19	26.23	26.28	26.32	26.36	26.40	26.44	26.48	26.52	26.56	26.60	26.64	26.68	26.72	26.76	26.80	26.84	26.88	26.93	26.97	27.01	27.05	27.09	27.13
152	25.70	25.74	25.78	25.82	25.86	25.90	25.94	25.98	26.02	26.06	26.11	26.15	26.19	26.23	26.27	26.31	26.35	26.39	26.43	26.47	26.51	26.55	26.59	26.63
150	25.20	25.24	25.29	25.33	25.37	25.41	25.45	25.49	25.53	25.57	25.61	25.65	25.69	25.73	25.77	25.81	25.85	25.89	25.93	25.98	26.02	26.06	26.10	26.14
148	24.71	24.75	24.79	24.83	24.87	24.91	24.95	24.99	25.03	25.07	25.11	25.16	25.20	25.24	25.28	25.32	25.36	25.40	25.44	25.48	25.52	25.56	25.60	25.64
146	24.21	24.25	24.29	24.34	24.38	24.42	24.46	24.50	24.54	24.58	24.62	24.66	24.70	24.74	24.78	24.82	24.86	24.90	24.94	24.98	25.03	25.07	25.11	25.15
144	23.72	23.76	23.80	23.84	23.88	23.92	23.96	24.00	24.04	24.08	24.12	24.16	24.21	24.25	24.29	24.33	24.37	24.41	24.45	24.49	24.53	24.57	24.61	24.65
142	23.22	23.26	23.30	23.34	23.39	23.43	23.47	23.51	23.55	23.59	23.63	23.67	23.71	23.75	23.79	23.83	23.87	23.91	23.95	23.99	24.04	24.08	24.12	24.16
140	22.73	22.77	22.81	22.85	22.89	22.93	22.97	23.01	23.05	23.09	23.13	23.17	23.22	23.26	23.30	23.34	23.38	23.42	23.46	23.50	23.54	23.58	23.62	23.66
138	22.23	22.27	22.31	22.35	22.40	22.44	22.48	22.52	22.56	22.60	22.64	22.64	22.72	22.76	22.80	22.84	22.88	22.92	22.96	23.00	23.04	23.09	23.13	23.17
136	21.74	21.78	21.82	21.86	21.90	21.94	21.98	22.02	22.06	22.10	22.14	22.18	22.22	22.27	22.31	22.35	22.39	22.43	22.47	22.51	22.55	22.59	22.63	22.67
134	21.24	21.28	21.32	21.36	21.40	21.45	21.49	21.53	21.57	21.61	21.65	21.69	21.73	21.77	21.81	21.85	21.89	21.93	21.97	22.01	22.05	22.09	22.14	22.18
132	20.75	20.79	20.83	20.87	20.91	20.95	20.99	21.03	21.07	21.11	21.15	21.19	21.23	21.27	21.32	21.36	21.40	21.44	21.48	21.52	21.56	21.60	21.64	21.68
130	20.25	20.29	20.33	20.37	20.41	20.45	20.50	20.54	20.58	20.62	20.66	20.70	20.74	20.78	20.82	20.86	20.90	20.94	20.98	21.02	21.06	21.10	21.15	21.19
128	19.76	19.80	19.84	19.88	19.92	19.96	20.00	20.04	20.08	20.12	20.16	20.20	20.24	20.28	20.33	20.37	20.41	20.45	20.49	20.53	20.57	20.61	20.65	20.69

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.01	.02	.02	.03
.1	.02	.03	.04	.05	.06
.2	.05	.06	.07	.07	.08
.3	.07	.08	.09	.10	.11
.4	.10	.11	.12	.12	.13
.5	.12	.13	.14	.15	.16
.6	.15	.16	.16	.17	.18
.7	.17	.18	.19	.20	.21
.8	.20	.21	.21	.22	.23
.9	.22	.23	.24	.25	.26
1.0	.25	.26	.26	.27	.28
1.1	.27	.28	.29	.30	.30
1.2	.30	.31	.31	.32	.33
1.3	.32	.33	.34	.35	.35
1.4	.35	.36	.36	.37	.38
1.5	.37	.38	.39	.40	.40
1.6	.40	.40	.41	.42	.43
1.7	.42	.43	.44	.45	.45
1.8	.45	.45	.46	.47	.48
1.9	.47	.48	.49	.50	.50

Table 41

Predicting Weight (Kilograms) of Boys, Age Thirteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																				
	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2
93.0	26.14	26.98	27.83	28.67	29.51	30.36	31.20	32.04	32.88	33.73	34.57	35.41	36.25	37.10	37.94	38.78	39.62	40.47	41.31	42.15	43.00
91.5	24.92	25.76	26.60	27.45	28.29	29.13	29.98	30.82	31.66	32.50	33.35	34.19	35.03	35.87	36.72	37.56	38.40	39.24	40.09	40.93	41.77
90.0	23.70	24.54	25.38	26.22	27.07	27.91	28.75	29.60	30.44	31.28	32.12	32.97	33.81	34.65	35.49	36.34	37.18	38.02	38.86	39.71	40.55
88.5	22.47	23.32	24.16	25.00	25.84	26.69	27.53	28.37	29.22	30.06	30.90	31.74	32.59	33.43	34.27	35.11	35.96	36.80	37.64	38.48	39.33
87.0	21.25	22.09	22.94	23.78	24.62	25.46	26.31	27.15	27.99	28.84	29.68	30.52	31.36	32.21	33.05	33.89	34.73	35.58	36.42	27.26	38.10
85.5	20.03	20.87	21.71	22.56	23.40	24.24	25.08	25.93	26.77	27.61	28.46	29.30	30.14	30.98	31.83	32.67	33.51	34.35	35.20	26.04	36.88
84.0	18.81	19.65	20.49	21.33	22.18	23.02	23.86	24.70	25.55	26.39	27.23	28.08	28.92	29.76	30.60	31.45	32.29	33.13	33.97	34.82	35.66
82.5	17.58	18.43	19.27	20.11	20.95	21.80	22.64	23.48	24.32	25.17	26.01	26.85	27.70	28.54	29.38	30.22	31.07	31.91	32.75	33.59	34.44
81.0	16.36	17.20	18.05	18.89	19.73	20.57	21.42	22.26	23.10	23.94	24.79	25.63	26.47	27.32	28.16	29.00	29.84	30.69	31.53	32.37	33.21
79.5	15.14	15.98	16.82	17.67	18.51	19.35	20.19	21.04	21.88	22.72	23.56	24.41	25.25	26.09	26.94	27.78	28.62	29.46	30.31	31.15	31.99
78.0	13.92	14.76	15.60	16.44	17.29	18.13	18.97	19.81	20.66	21.50	22.34	23.18	24.03	24.87	25.71	26.56	27.40	28.24	29.08	29.93	30.77
76.5	12.69	13.54	14.38	15.22	16.06	16.91	17.75	18.59	19.43	20.28	21.12	21.96	22.80	23.65	24.49	25.33	26.18	27.02	27.86	28.70	29.55
75.0	11.47	12.31	13.16	14.00	14.84	15.68	16.53	17.37	18.21	19.05	19.90	20.74	21.58	22.42	23.27	24.11	24.95	25.80	26.64	27.48	28.32
73.5	10.25	11.09	11.93	12.78	13.62	14.46	15.30	16.15	16.99	17.83	18.67	19.52	20.36	21.20	22.04	22.89	23.73	24.57	25.42	26.26	27.10
72.0	9.02	9.87	10.71	11.55	12.40	13.24	14.08	14.92	15.77	16.61	17.45	18.29	19.14	19.98	20.82	21.66	22.51	23.35	24.19	25.04	25.88
70.5	7.80	8.64	9.49	10.33	11.17	12.02	12.86	13.70	14.54	15.39	16.23	17.07	17.91	18.76	19.60	20.44	21.28	22.13	22.97	23.81	24.66
69.0	6.58	7.42	8.26	9.11	9.95	10.79	11.64	12.48	13.32	14.16	15.01	15.85	16.69	17.53	18.38	19.22	20.06	20.91	21.75	22.59	23.43
67.5	5.36	6.20	7.04	7.88	8.73	9.57	10.41	11.26	12.10	12.94	13.78	14.63	15.47	16.31	17.15	18.00	18.84	19.68	20.53	21.37	22.21
66.0	4.13	4.98	5.82	6.66	7.50	8.35	9.19	10.03	10.88	11.72	12.56	13.40	14.25	15.09	15.93	16.77	17.62	18.46	19.30	20.15	20.99
64.5	2.91	3.75	4.60	5.44	6.28	7.12	7.97	8.81	9.65	10.50	11.34	12.18	13.02	13.87	14.71	15.55	16.39	17.24	18.08	18.92	19.77
63.0	1.69	2.53	3.37	4.22	5.06	5.90	6.74	7.59	8.43	9.27	10.12	10.96	11.80	12.64	13.49	14.33	15.17	16.01	16.86	17.70	18.54
61.5	0.47	1.31	2.15	2.99	3.84	4.68	5.52	6.36	7.21	8.05	8.89	9.74	10.58	11.42	12.26	13.11	13.95	14.79	15.63	16.48	17.32
60.0	- .76	.09	.93	1.77	2.61	3.46	4.30	5.14	5.98	6.83	7.67	8.51	9.36	10.20	11.04	11.88	12.73	13.57	14.41	15.25	16.10
58.5	-1.98	-1.14	- .29	0.55	1.39	2.23	3.08	3.92	4.76	5.60	6.45	7.29	8.13	8.98	9.82	10.66	11.50	12.35	13.19	14.03	14.87
57.0	-3.20	-2.36	-1.52	- .67	.17	1.01	1.85	2.70	3.54	4.38	5.22	6.07	6.91	7.75	8.60	9.44	10.28	11.12	11.97	12.81	13.65
55.5	-4.42	-3.58	-2.74	-1.90	-1.05	- .21	.63	1.47	2.32	3.16	4.00	4.84	5.69	6.53	7.37	8.22	9.06	9.90	10.74	11.59	12.43

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.421
.1	.082	.503
.2	.163	.584
.3	.245	.666
.4	.326	.747
.5	.408	.829
.6	.489	.910
.7	.571	.992
.8	.652	1.073
.9	.734	1.155
1.0	.815	1.236
1.1	.897	1.318
1.2	.978	1.399
1.3	1.060	1.481
1.4	1.141	1.562

Table 42

Predicting Weight (Kilograms) of Boys, Age Fourteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																					
	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5
190	34.99	35.36	35.73	36.10	36.46	36.83	37.20	37.57	37.94	38.30	38.67	39.04	39.41	39.78	40.14	40.51	40.88	41.25	41.62	41.98	42.35	42.72
188	34.45	34.82	35.19	35.55	35.92	36.29	36.66	37.03	37.39	37.76	38.13	38.50	38.87	39.23	39.60	39.97	40.34	40.71	41.07	41.44	41.81	42.18
186	33.91	34.28	34.64	35.01	35.38	35.75	36.12	36.48	36.85	37.22	37.59	37.96	38.32	38.69	39.06	39.43	39.80	40.16	40.53	40.90	41.27	41.64
184	33.36	33.73	34.10	34.47	34.84	35.20	35.57	55.94	36.31	36.68	37.05	37.41	37.78	38.15	38.52	38.89	39.25	39.62	39.99	40.36	40.73	41.09
182	32.82	33.19	33.56	33.93	34.29	34.66	35.03	35.40	35.77	36.13	36.50	36.87	37.24	37.61	37.98	38.34	38.71	39.08	39.45	39.82	40.18	40.55
180	32.28	32.65	33.02	33.38	33.75	34.12	34.49	34.86	35.22	35.59	35.96	36.33	36.70	37.06	37.43	37.80	38.17	38.54	38.90	39.27	39.64	40.01
178	31.74	32.11	32.47	32.84	33.21	33.58	33.95	34.31	34.68	35.05	35.42	35.79	36.15	36.52	36.89	37.26	37.63	37.99	38.36	38.73	39.10	39.47
176	31.20	31.56	31.93	32.30	32.67	33.04	33.40	33.77	34.14	34.51	34.88	35.24	35.61	35.98	36.35	36.72	37.08	37.45	37.82	38.19	38.56	38.92
174	30.65	31.02	31.39	31.76	32.12	32.49	32.86	33.23	33.60	33.97	34.33	34.70	35.07	35.44	35.81	36.17	36.54	36.91	37.28	37.65	38.01	38.38
172	30.11	30.48	30.85	31.21	31.58	31.95	32.32	32.69	33.05	33.42	33.79	34.16	34.53	34.89	35.26	35.63	36.00	36.37	36.74	37.10	37.47	37.84
170	29.57	29.94	30.30	30.67	31.04	31.41	31.78	32.14	32.51	32.88	33.25	33.62	33.98	34.35	34.72	35.09	35.46	35.82	36.19	36.56	36.93	37.30
168	29.03	29.39	29.76	30.13	30.50	30.87	31.23	31.60	31.97	32.34	32.71	33.07	33.44	33.81	34.18	34.55	34.91	35.28	35.65	36.02	36.39	36.75
166	28.48	28.85	29.22	29.59	29.96	30.32	30.69	31.06	31.43	31.80	32.16	32.53	32.90	33.27	33.64	34.00	34.37	34.74	35.11	35.48	35.84	36.21
164	27.94	28.31	28.68	29.04	29.41	29.78	30.15	30.52	30.89	31.25	31.62	31.99	32.36	32.73	33.09	33.46	33.83	34.20	34.57	34.93	35.30	35.67
162	27.40	27.77	28.13	28.50	28.87	29.24	29.61	29.97	30.34	30.71	31.08	31.45	31.81	32.18	32.55	32.92	33.29	33.66	34.02	34.39	34.76	35.13
160	26.86	27.22	27.59	27.96	28.33	28.70	29.06	29.43	29.80	30.17	30.54	30.90	31.27	31.64	32.01	32.38	32.74	33.11	33.48	33.85	34.22	34.58
158	26.31	26.68	27.05	27.42	27.79	28.15	28.52	28.89	29.26	29.63	29.99	30.36	30.73	31.10	31.47	31.83	32.20	32.57	32.94	33.31	33.67	34.04
156	25.77	26.14	26.51	26.88	27.24	27.61	27.98	28.35	28.72	29.08	29.45	29.62	30.19	30.56	30.92	31.29	31.66	32.03	32.40	32.76	33.13	33.50
154	25.23	25.60	25.96	26.33	26.70	27.07	27.44	27.81	28.17	28.54	28.91	29.28	29.65	30.01	30.38	30.75	31.12	31.49	31.85	32.22	32.59	32.96
152	24.69	25.05	25.42	25.79	26.16	26.53	26.89	27.26	27.63	28.00	28.37	28.73	29.10	29.47	29.84	30.21	30.58	30.94	31.31	31.68	32.05	32.42
150	24.14	24.51	24.88	25.25	25.62	25.98	26.36	26.72	27.09	27.46	27.82	28.19	28.56	28.93	29.30	29.66	30.03	30.40	30.77	31.14	31.50	31.87
148	23.60	23.97	24.34	24.71	25.07	25.44	25.81	26.18	26.55	26.91	27.28	27.65	28.02	28.39	28.75	29.12	29.49	29.86	30.23	30.59	30.96	31.33
146	23.06	23.43	23.80	24.16	24.53	24.90	25.27	25.64	26.00	26.37	26.74	27.11	27.48	27.84	28.21	28.58	28.95	29.32	29.68	30.05	30.42	30.79
144	22.52	22.88	23.25	23.62	23.99	24.36	24.73	25.09	25.46	25.83	26.20	26.57	26.93	27.30	27.67	28.04	28.41	28.77	29.14	29.51	29.88	30.25
142	21.97	22.34	22.71	23.08	23.45	23.81	24.18	24.55	24.92	25.29	25.65	26.02	26.39	26.76	27.13	27.50	27.86	28.23	28.60	28.97	29.34	29.70
140	21.43	21.80	22.17	22.54	22.90	23.27	23.64	24.01	24.38	24.74	25.11	25.48	25.85	26.22	26.58	26.95	27.32	27.69	28.06	28.42	28.79	29.16
138	20.89	21.26	21.63	21.99	22.36	22.73	23.10	23.47	23.83	24.20	24.57	24.94	25.31	25.67	26.04	26.41	26.78	27.15	27.51	27.88	28.25	28.62
136	20.35	20.72	21.08	21.45	21.82	22.19	22.56	22.92	23.29	23.66	24.03	24.40	24.76	25.13	25.50	25.87	26.24	26.60	26.97	27.34	27.71	28.08

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.07	.15	.22	.29
.1	.03	.10	.17	.25	.32
.2	.05	.13	.20	.28	.35
.3	.08	.15	.23	.30	.38
.4	.11	.18	.26	.33	.40
.5	.14	.21	.28	.36	.43
.6	.16	.24	.31	.38	.46
.7	.19	.26	.34	.41	.48
.8	.22	.29	.36	.44	.51
.9	.24	.32	.39	.46	.54
1.0	.27	.34	.42	.49	.57
1.1	.30	.37	.45	.52	.59
1.2	.33	.40	.47	.55	.62
1.3	.35	.43	.50	.57	.65
1.4	.38	.45	.53	.60	.67
1.5	.41	.48	.55	.63	.70
1.6	.43	.51	.58	.65	.73
1.7	.46	.53	.61	.68	.76
1.8	.49	.56	.64	.71	.78
1.9	.51	.59	.66	.74	.81

Table 43

Predicting Weight (Kilograms) of Boys, Age Fourteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																
	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0
91	26.77	27.40	28.03	28.66	29.29	29.92	30.55	31.18	31.81	32.44	33.07	33.70	34.33	34.95	35.58	36.21	36.84
90	25.97	26.60	27.23	27.86	28.49	29.12	29.75	30.38	31.01	31.64	32.27	32.90	33.53	34.16	34.79	35.42	36.05
89	25.18	25.81	26.44	27.07	27.70	28.33	28.96	29.59	30.22	30.85	31.48	32.11	32.74	33.37	34.00	34.63	35.26
88	24.39	25.02	25.65	26.28	26.91	27.54	28.17	28.80	29.43	30.06	30.69	31.32	31.94	32.57	33.20	33.83	34.46
87	23.59	24.22	24.85	25.48	26.11	26.74	27.37	28.00	28.63	29.26	29.89	30.52	31.15	31.78	32.41	33.04	33.67
86	22.80	23.43	24.06	24.69	25.32	25.95	26.58	27.21	27.84	28.47	29.10	29.73	30.36	30.99	31.62	32.25	32.88
85	22.01	22.64	23.27	23.90	24.53	25.16	25.79	26.42	27.05	27.68	28.30	28.93	29.56	30.19	30.82	31.45	32.08
84	21.21	21.84	22.47	23.10	23.73	24.36	24.99	25.62	26.25	26.88	27.51	28.14	28.77	29.40	30.03	30.66	31.29
83	20.42	21.05	21.68	22.31	22.94	23.57	24.20	24.83	25.46	26.09	26.72	27.35	27.98	28.61	29.24	29.87	30.50
82	19.63	20.26	20.89	21.52	22.15	22.78	23.41	24.04	24.66	25.29	25.92	26.55	27.18	27.82	28.44	29.07	29.70
81	18.83	19.46	20.09	20.72	21.35	21.98	22.61	23.24	23.87	24.50	25.13	25.76	26.39	27.02	27.65	28.28	28.91
80	18.04	18.67	19.30	19.93	20.56	21.19	21.82	22.45	23.08	23.71	24.34	24.97	25.60	26.23	26.86	27.49	28.12
79	17.25	17.88	18.51	19.14	19.77	20.40	21.02	21.65	22.28	22.91	23.54	24.17	24.80	25.43	26.06	26.69	27.32
78	16.45	17.08	17.71	18.34	18.97	19.60	20.23	20.86	21.49	22.12	22.75	23.38	24.01	24.64	25.27	25.90	26.53
77	15.66	16.29	16.92	17.55	18.18	18.81	19.44	20.07	20.70	21.33	21.96	22.59	23.22	23.85	24.48	25.11	25.74
76	14.87	15.50	16.13	16.76	17.38	18.01	18.64	19.27	19.90	20.53	21.16	21.79	22.42	23.05	23.68	24.31	24.94
75	14.07	14.70	15.33	15.96	16.59	17.22	17.85	18.48	19.11	19.74	20.37	21.00	21.63	22.26	22.89	23.52	24.15
74	13.28	13.91	14.54	15.17	15.80	16.43	17.06	17.69	18.32	18.95	19.58	20.21	20.84	21.47	22.10	22.72	23.35
73	12.49	13.12	13.74	14.37	15.00	15.63	16.26	16.89	17.52	18.15	18.78	19.41	20.04	20.67	21.30	21.93	22.56
72	11.69	12.32	12.95	13.58	14.21	14.84	15.47	16.10	16.73	17.36	17.99	18.62	19.25	19.88	20.51	21.14	21.77
71	10.90	11.53	12.16	12.79	13.42	14.05	14.68	15.31	15.94	16.57	17.20	17.83	18.46	19.08	19.71	20.34	20.97
70	10.10	10.73	11.36	11.99	12.62	13.25	13.88	14.51	15.14	15.77	16.40	17.03	17.66	18.29	18.92	19.55	20.18
69	9.31	9.94	10.57	11.20	11.83	12.46	13.09	13.72	14.35	14.98	15.61	16.24	16.87	17.50	18.13	18.76	19.39
68	8.52	9.15	9.78	10.41	11.04	11.67	12.30	12.93	13.56	14.19	14.82	15.45	16.07	16.70	17.33	17.96	18.59
67	7.72	8.35	8.98	9.61	10.24	10.87	11.50	12.13	12.76	13.39	14.02	14.65	15.28	15.91	16.54	17.17	17.80
66	6.93	7.56	8.19	8.82	9.45	10.08	10.71	11.34	11.97	12.60	13.23	13.86	14.49	15.12	15.75	16.38	17.01
65	6.14	6.77	7.40	8.03	8.66	9.29	9.92	10.55	11.18	11.81	12.43	13.06	13.69	14.32	14.95	15.58	16.21
64	5.34	5.97	6.60	7.23	7.86	8.49	9.12	9.75	10.38	11.01	11.64	12.27	12.90	13.53	14.16	14.79	15.42
63	4.55	5.18	5.81	6.44	7.07	7.70	8.33	8.96	9.59	10.22	10.85	11.48	12.71	12.74	13.37	14.00	14.63
62	3.76	4.39	5.02	5.65	6.28	6.91	7.54	8.17	8.79	9.42	10.05	10.68	11.31	11.94	12.57	13.20	13.83
61	2.96	3.59	4.22	4.85	5.48	6.11	6.74	7.37	8.00	8.63	9.26	9.89	10.52	11.15	11.78	12.41	13.04
60	2.17	2.80	3.43	4.06	4.69	5.32	5.95	6.58	7.21	7.84	8.47	9.10	9.73	10.36	10.99	11.62	12.25

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.315
.1	.079	.394
.2	.159	.474
.3	.238	.553
.4	.317	.632
.5	.397	.712
.6	.476	.791
.7	.555	.870
.8	.635	.950
.9	.714	1.029

Table 44

Predicting Weight (Kilograms) of Boys, Age Fifteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centi- meters	Hip Width, Centimeters																					
	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5*	32.0
192	35.38	35.83	36.28	36.74	37.19	37.64	38.10	38.55	39.00	39.46	39.91	40.36	40.81	41.27	41.22	42.17	42.63	43.08	43.53	43.99	44.44	44.89
190	34.78	35.23	35.68	36.14	36.59	37.04	37.49	37.95	38.40	38.85	39.31	39.76	40.21	40.67	41.12	41.57	42.02	42.48	42.93	43.38	43.84	44.29
188	34.18	34.53	35.08	35.53	35.99	36.44	36.89	37.35	37.80	38.25	38.71	39.16	39.61	40.06	40.52	40.97	41.42	42.88	42.33	42.78	43.24	43.69
186	33.57	34.03	34.48	34.93	35.39	35.84	36.29	36.74	37.20	37.65	38.10	38.56	39.01	39.46	39.92	40.37	40.82	41.27	41.73	42.18	42.63	43.09
184	32.97	33.42	33.98	34.33	34.78	35.24	35.69	36.14	36.60	37.05	37.50	37.95	38.41	38.86	39.31	39.77	40.22	40.67	41.13	41.58	42.03	42.48
182	32.37	32.82	33.28	33.73	34.18	34.64	35.09	35.54	35.99	36.45	36.90	37.35	37.81	38.26	38.71	39.17	39.62	40.07	40.52	40.98	41.43	41.88
180	31.77	32.22	32.57	33.13	33.58	34.03	34.49	34.94	35.39	35.85	36.30	36.75	37.20	37.66	38.11	38.56	39.02	39.47	39.92	40.38	40.83	41.28
178	31.17	31.62	32.07	32.53	32.98	33.43	33.89	34.34	34.79	35.24	35.70	36.15	36.60	37.06	37.51	37.96	38.42	38.87	39.32	39.77	40.23	40.68
176	30.57	31.02	31.47	31.92	32.38	32.83	33.28	33.74	34.19	34.64	35.10	35.55	36.00	36.45	36.91	37.36	37.81	38.27	38.72	39.17	39.63	40.08
174	29.96	30.42	30.97	31.32	31.78	32.23	32.68	33.13	33.59	34.04	34.49	34.95	35.40	35.85	36.31	36.76	37.21	37.66	38.12	38.57	39.02	39.48
172	29.36	29.32	30.27	30.72	31.17	31.63	32.08	32.53	32.39	33.44	33.89	34.35	34.80	35.25	35.70	36.16	36.61	37.06	37.52	37.97	38.42	38.88
170	28.76	29.21	29.67	30.12	30.57	31.03	31.48	31.93	32.38	32.84	33.29	33.74	34.20	34.65	35.10	35.56	36.01	36.46	36.91	37.37	37.82	38.27
168	28.16	28.61	29.07	29.52	29.97	30.42	30.88	31.33	31.78	32.24	32.69	33.14	33.60	34.05	34.50	34.95	35.41	35.86	36.31	36.77	37.22	37.67
166	27.56	28.01	28.46	28.92	29.37	29.82	30.28	30.73	31.18	31.63	32.09	32.54	32.99	33.45	33.90	34.35	34.81	35.26	35.71	36.16	36.62	37.07
164	26.96	27.41	27.86	28.31	28.77	29.22	29.67	30.13	30.58	31.03	31.49	31.94	32.39	32.84	33.30	33.75	34.20	34.66	35.11	35.56	36.02	36.47
162	26.35	26.81	27.26	27.71	28.17	28.62	29.07	29.55	29.98	30.43	30.88	31.34	31.79	32.24	32.70	33.15	33.60	34.06	34.51	34.96	35.41	35.87
160	25.75	26.21	26.66	27.11	27.56	28.02	28.47	28.92	29.38	29.83	30.28	30.74	31.19	31.64	32.09	32.55	33.00	33.45	33.91	34.36	34.81	35.27
158	25.15	25.60	26.06	26.51	26.96	27.42	27.87	28.32	28.78	29.23	29.68	30.13	30.59	31.04	31.49	31.95	32.40	32.85	33.31	33.76	34.21	34.66
156	24.55	25.00	25.46	25.91	26.36	26.81	27.27	27.72	28.17	28.63	29.08	29.53	29.99	30.44	30.89	31.34	31.60	32.25	32.70	33.16	33.61	34.06
154	23.95	24.40	24.85	25.31	25.76	26.21	26.67	27.12	27.57	28.02	28.48	28.93	29.38	29.84	30.29	30.74	31.20	31.65	32.10	32.55	33.01	33.46
152	23.35	23.80	24.25	24.71	25.16	25.61	26.06	26.52	26.97	27.42	27.88	28.33	28.78	29.24	29.69	30.14	30.59	31.05	31.50	31.95	32.41	32.86
150	22.74	23.20	23.65	24.10	24.56	25.01	25.46	25.92	26.37	26.82	27.27	27.73	28.18	28.63	29.09	29.54	29.99	30.45	30.90	31.35	31.80	32.26
148	22.14	22.60	23.05	23.50	23.96	24.41	24.86	25.31	25.77	26.22	26.67	27.13	27.58	28.03	28.49	28.94	29.39	29.84	30.30	30.75	31.20	31.66
146	21.54	21.99	22.45	22.90	23.35	23.81	24.26	24.71	25.17	25.62	26.07	26.52	26.98	27.43	27.88	28.34	28.79	29.24	29.70	30.15	30.60	31.05
144	20.94	21.39	21.85	22.30	22.75	23.20	23.66	24.11	24.56	25.02	25.47	25.92	26.38	26.83	27.28	27.73	28.19	28.64	29.09	29.55	30.00	30.45
142	20.34	20.79	21.24	21.70	22.15	22.60	23.06	23.51	23.96	24.42	24.87	25.32	25.77	26.23	26.68	27.13	27.59	28.04	28.49	28.95	29.40	29.85
140	19.74	20.19	20.64	21.10	21.55	22.00	22.45	22.91	23.36	23.81	24.27	24.72	25.17	25.63	26.08	26.53	26.98	27.44	27.89	28.34	28.80	29.25

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.09	.18	.27	.36
.1	.03	.12	.21	.30	.39
.2	.06	.15	.24	.33	.42
.3	.09	.18	.27	.36	.45
.4	.12	.21	.30	.39	.48
.5	.15	.24	.33	.42	.51
.6	.18	.27	.36	.45	.54
.7	.21	.30	.39	.48	.57
.8	.24	.33	.42	.51	.60
.9	.27	.36	.45	.54	.63
1.0	.30	.39	.48	.57	.66
1.1	.33	.42	.51	.60	.69
1.2	.36	.45	.54	.63	.72
1.3	.39	.48	.57	.66	.75
1.4	.42	.51	.60	.69	.78
1.5	.45	.54	.63	.72	.81
1.6	.48	.57	.66	.75	.84
1.7	.51	.60	.69	.78	.87
1.8	.54	.63	.72	.81	.90
1.9	.57	.66	.75	.84	.93

Table 45

Predicting Weight (Kilograms) of Boys, Age Fifteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters															
	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8
94.5	25.43	26.30	27.12	28.05	28.93	29.80	30.67	31.55	32.42	33.30	34.17	35.05	35.92	36.80	37.67	38.55
93.0	24.45	25.33	26.20	27.08	27.95	28.83	29.70	30.58	31.45	32.32	33.20	34.07	34.95	35.82	36.70	37.57
91.5	23.48	24.36	25.23	26.10	26.98	27.85	28.73	29.60	30.48	31.35	32.23	33.10	33.97	34.85	35.72	36.60
90.0	22.51	23.38	24.26	25.13	26.01	26.88	27.75	28.63	29.50	30.38	31.25	32.13	33.00	33.88	34.75	35.63
88.5	21.53	22.41	23.28	24.16	25.03	25.91	26.78	27.66	28.53	29.40	30.28	31.15	32.03	32.90	33.78	34.65
87.0	20.56	21.44	22.31	23.18	24.06	24.93	25.81	26.68	27.56	28.43	29.31	30.18	31.05	31.93	32.80	33.68
85.5	19.59	20.45	21.34	22.21	23.09	23.96	24.83	25.71	26.58	27.46	28.33	29.21	30.08	30.96	31.83	32.71
84.0	18.61	19.49	20.36	21.24	22.11	22.99	23.86	24.74	25.61	26.48	27.36	28.23	29.11	29.98	30.86	31.73
82.5	17.64	18.52	19.39	20.26	21.14	22.01	22.89	23.76	24.64	25.51	26.39	27.26	28.13	29.01	29.88	30.76
81.0	16.67	17.54	18.42	19.29	20.17	21.04	21.91	22.79	23.66	24.54	25.41	26.29	27.16	28.04	28.91	29.78
79.5	15.69	16.57	17.44	18.32	19.19	20.07	20.94	21.82	22.69	23.56	24.44	25.31	26.19	27.06	27.94	28.81
78.0	14.72	15.60	16.47	17.34	18.22	19.09	19.97	20.84	21.72	22.59	23.47	24.34	25.21	26.09	26.96	27.84
76.5	13.75	14.62	15.50	16.37	17.25	18.12	18.99	19.87	20.74	21.62	22.49	23.37	24.24	25.12	25.99	26.86
75.0	12.77	13.65	14.52	15.40	16.27	17.15	18.02	18.90	19.77	20.64	21.52	22.39	23.27	24.14	25.02	25.89
73.5	11.80	12.67	13.55	14.42	15.30	16.17	17.05	17.92	18.80	19.67	20.55	21.42	22.29	23.17	24.04	24.92
72.0	10.83	11.70	12.58	13.45	14.33	15.20	16.07	16.95	17.82	18.70	19.57	20.45	21.32	22.20	23.07	23.94
70.5	9.85	10.73	11.60	12.48	13.35	14.23	15.10	15.98	16.85	17.72	18.60	19.47	20.35	21.22	22.10	22.97
69.0	8.88	9.75	10.63	11.50	12.38	13.25	14.13	15.00	15.88	16.75	17.63	18.50	19.37	20.25	21.12	22.00
67.5	7.91	8.87	9.66	10.53	11.41	12.28	13.15	14.03	14.90	15.78	16.65	17.53	18.40	19.28	20.15	21.02
66.0	6.93	7.81	8.68	9.56	10.43	11.31	12.18	13.06	13.93	14.80	15.68	16.55	17.43	18.30	19.18	20.05
64.5	5.96	6.83	7.71	8.58	9.46	10.33	11.21	12.08	12.96	13.83	14.71	15.58	16.45	17.33	18.20	19.08
63.0	4.99	5.86	6.74	7.61	8.49	9.36	10.23	11.11	11.98	12.86	13.73	14.61	15.48	16.36	17.23	18.10
61.5	4.01	4.89	5.76	6.64	7.51	8.39	9.26	10.14	11.01	11.88	12.76	13.63	14.51	15.38	16.26	17.13

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.437
.1	.065	.502
.2	.130	.567
.3	.195	.632
.4	.260	.697
.5	.324	.762
.6	.389	.827
.7	.454	.891
.8	.519	.956
.9	.584	1.021
1.0	.649	1.086
1.1	.714	1.151
1.2	.779	1.216
1.3	.844	1.281
1.4	.908	1.346

Table 46

Predicting Weight (Kilograms) of Boys, Age Sixteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .2808 height + .6960 hips + .7840 chest circumference + 5.0191 knee - 119.5505)

Height, Centi-meters	Hip Width, Centimeters																									
	22.4	22.8	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.4
195.0	40.80	41.07	41.35	41.63	41.91	42.19	42.47	42.74	43.02	43.30	43.58	43.86	44.14	42.42	44.69	44.97	45.25	45.53	45.81	46.09	46.36	46.64	46.92	47.20	47.48	47.76
193.5	40.37	40.65	40.93	41.21	41.49	41.77	42.05	42.32	42.60	42.88	43.16	43.44	43.72	43.99	44.27	44.55	44.83	45.11	45.39	45.66	45.94	46.22	46.50	46.78	47.06	47.33
192.0	39.95	40.23	40.51	40.79	41.07	41.35	41.62	41.90	42.18	42.46	42.74	43.02	43.29	43.57	43.85	44.13	44.41	44.69	44.96	45.24	45.52	45.80	46.08	46.36	46.64	46.91
190.5	39.53	39.81	40.09	40.37	40.65	40.92	41.20	41.48	41.76	42.04	42.32	42.59	42.87	43.15	43.43	43.71	43.99	44.27	44.54	44.82	45.10	45.38	45.66	45.94	46.21	46.49
189.0	39.11	39.39	39.67	39.95	40.22	40.50	40.78	41.06	41.34	41.62	41.90	42.17	42.45	42.73	43.01	43.29	43.57	43.84	44.12	44.40	44.68	44.96	45.24	45.51	45.79	46.07
187.5	38.69	38.97	39.25	39.53	39.80	40.08	40.36	40.64	40.92	41.20	41.47	41.75	42.03	42.31	42.59	42.87	43.14	43.42	43.70	43.98	44.26	44.54	44.81	45.09	45.37	45.65
186.0	38.27	38.55	38.83	39.10	39.38	39.66	39.94	40.22	40.50	40.77	41.05	41.33	41.61	41.89	42.17	42.44	42.72	43.00	43.28	43.56	43.84	44.12	44.39	44.67	44.95	45.23
184.5	37.85	38.13	38.40	38.68	38.96	39.24	39.52	39.80	40.07	40.35	40.63	40.91	41.19	41.47	41.75	42.02	42.30	42.58	42.86	43.14	43.42	43.69	43.97	44.25	44.53	44.81
183.0	37.43	37.70	37.98	38.26	38.54	38.82	39.10	39.38	39.65	39.93	40.21	40.49	40.77	41.05	41.32	41.60	41.88	42.16	42.44	42.72	42.99	43.27	43.55	43.83	44.11	44.39
181.5	37.01	37.28	37.56	37.84	38.12	38.40	38.68	38.95	39.23	39.51	39.79	40.07	40.35	40.62	40.90	41.18	41.46	41.74	42.02	42.29	42.57	42.85	43.13	43.41	43.69	43.97
180.0	36.58	36.86	37.14	37.42	37.70	37.98	38.25	38.53	38.81	39.09	39.37	39.65	39.92	40.20	40.48	40.76	41.04	41.32	41.60	41.87	42.15	42.43	42.71	42.99	43.27	43.54
178.5	36.16	36.44	36.72	37.00	37.28	37.55	37.83	38.11	38.39	38.67	38.95	39.23	39.50	39.78	40.06	40.34	40.62	40.90	41.17	41.45	41.73	42.01	42.29	42.57	42.84	43.12
177.0	35.74	36.02	36.30	36.58	36.86	37.13	37.41	37.69	37.97	38.25	38.53	38.80	39.08	39.36	39.64	39.92	40.20	40.47	40.75	41.03	41.31	41.59	41.87	42.14	42.42	42.70
175.5	35.32	35.60	35.88	36.16	36.43	36.71	36.99	37.27	37.55	37.83	38.10	38.38	38.66	38.94	39.22	39.50	39.77	40.05	40.33	40.61	40.89	41.17	41.45	41.72	42.00	42.28
174.0	34.90	35.18	35.46	35.73	36.01	36.29	36.57	36.85	37.13	37.40	37.68	37.96	38.24	38.52	38.80	39.08	39.35	39.63	39.91	40.19	40.47	40.75	41.02	41.30	41.58	41.86
172.5	34.48	34.76	35.03	35.31	35.59	35.87	36.15	36.43	36.71	36.98	37.26	37.54	37.82	38.10	38.38	38.65	38.93	39.21	39.49	39.77	40.05	40.32	40.60	40.88	41.16	41.44
171.0	34.06	34.34	34.61	34.89	35.17	35.45	35.73	36.01	36.28	36.56	36.84	37.12	37.40	37.68	37.95	38.23	38.51	38.79	39.07	39.35	39.62	39.90	40.18	40.46	40.74	41.02
169.5	33.64	33.91	34.19	34.47	34.75	35.03	35.31	35.58	35.86	36.14	36.42	36.70	36.98	37.25	37.53	37.81	38.09	38.37	38.65	38.93	39.20	39.48	39.76	40.04	40.32	40.60
168.0	33.21	33.49	33.77	34.05	34.33	34.61	34.88	35.16	35.44	35.72	36.00	36.28	36.56	36.83	37.11	37.39	37.67	37.95	38.23	38.50	38.78	39.06	39.34	39.62	39.90	40.17
166.5	32.79	33.07	33.35	33.63	33.91	34.19	34.46	34.74	35.02	35.30	35.58	35.86	36.13	36.41	36.69	36.97	37.25	37.53	37.80	38.08	38.36	38.64	38.92	39.20	39.47	39.75
165.0	32.37	32.65	32.93	33.21	33.49	33.76	34.04	34.32	34.60	34.88	35.16	35.43	35.71	35.99	36.27	36.55	36.83	37.10	37.37	37.66	37.94	38.22	38.50	38.78	39.05	39.33
163.5	31.95	32.23	32.51	32.79	33.06	33.34	33.62	33.90	34.18	34.46	34.73	35.01	35.29	35.57	35.85	36.13	36.41	36.68	36.96	37.24	37.52	37.80	38.08	38.35	38.63	38.91
162.0	31.53	31.81	32.09	32.36	32.64	32.92	33.20	33.48	33.76	34.04	34.31	34.59	34.87	35.15	35.43	35.71	35.98	36.26	36.54	36.82	37.10	37.38	37.65	37.93	38.21	38.49
160.5	31.11	31.39	31.67	31.94	32.22	32.50	32.78	33.06	33.34	33.61	33.89	34.17	34.45	34.73	35.01	35.28	35.56	35.84	36.12	36.40	36.68	36.95	37.23	37.51	37.79	38.07
159.0	30.69	30.97	31.24	31.52	31.80	32.08	32.36	32.64	32.91	33.19	33.47	33.75	34.03	34.31	34.58	34.86	35.14	35.42	35.70	35.78	36.26	36.53	36.81	37.09	37.37	37.65
157.5	30.27	30.54	30.82	31.10	31.38	31.66	31.94	32.21	32.49	32.77	33.05	33.33	33.61	33.89	34.16	34.44	34.72	35.00	35.28	35.56	35.83	36.11	36.39	36.67	36.95	37.23
156.0	29.84	30.12	30.40	30.68	30.96	31.24	31.52	31.79	32.07	32.35	32.63	32.91	33.19	33.46	33.74	34.02	34.30	34.58	34.86	35.13	35.41	35.69	35.97	36.25	36.53	36.80
154.5	29.42	29.70	29.98	30.26	30.54	30.82	31.09	31.37	31.65	31.93	32.21	32.49	32.76	33.04	33.32	33.60	33.88	34.16	34.43	34.71	34.99	35.27	35.55	35.83	36.11	36.38
153.0	29.00	29.28	29.56	29.84	30.12	30.39	30.67	30.95	31.23	31.51	31.79	32.06	32.34	32.62	32.90	33.18	33.46	33.74	34.01	34.29	34.57	34.85	35.13	35.41	35.68	35.96
151.5	28.58	28.86	29.14	29.42	29.69	29.97	30.25	30.53	30.81	31.09	31.37	31.64	31.92	32.20	32.48	32.76	33.04	33.31	33.59	33.87	34.15	34.43	34.71	34.98	35.26	35.54
150.0	28.16	28.44	28.72	29.00	29.27	29.55	29.83	30.11	30.39	30.67	30.94	31.22	31.50	31.78	32.06	32.34	32.61	32.89	33.17	33.45	33.73	34.01	34.28	34.56	34.84	35.12
148.5	27.74	28.02	28.30	28.57	28.85	29.13	29.41	29.69	29.97	30.24	30.52	30.80	31.08	31.36	31.64	31.91	32.19	32.47	32.75	33.03	33.31	33.59	33.86	34.14	34.42	34.70

Interpolation Table

Height	Hips			
	0	.1	.2	.3
0	0	.070	.139	.209
.1	.028	.098	.167	.237
.2	.056	.126	.195	.265
.3	.084	.154	.223	.293
.4	.112	.182	.252	.321
.5	.140	.210	.280	.349
.6	.168	.238	.308	.377
.7	.197	.266	.336	.405
.8	.225	.294	.364	.433
.9	.253	.322	.392	.462
1.0	.281	.350	.420	.490
1.1	.309	.378	.448	.518
1.2	.337	.407	.476	.546
1.3	.365	.435	.504	.574
1.4	.393	.463	.532	.602

Table 47

Predicting Weight (Kilograms) of Boys, Age Sixteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																				
	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9
96	26.42	26.92	27.42	27.93	28.43	28.93	29.43	29.93	30.44	30.94	31.44	31.94	32.44	32.95	33.45	33.95	34.45	34.95	35.46	35.96	36.46	36.96	37.46	37.96	38.47	38.97	39.47	39.97
95	25.64	26.14	26.64	27.14	27.64	28.15	28.65	29.15	29.65	30.15	30.66	31.16	31.66	32.16	32.66	33.17	33.67	34.17	34.67	35.17	35.67	36.18	36.68	37.18	37.68	38.19	38.69	39.19
94	24.85	25.35	25.86	26.36	26.86	27.36	27.86	28.37	28.87	29.37	29.87	30.37	30.88	31.38	31.88	32.38	32.88	33.39	33.89	34.39	34.89	35.39	35.89	36.40	36.90	37.40	37.90	38.40
93	24.07	24.57	25.07	25.57	26.08	26.58	27.08	27.58	28.08	28.59	29.09	29.59	30.09	30.59	31.10	31.60	32.10	32.60	33.10	33.60	34.11	34.61	35.11	35.61	36.11	36.62	37.12	37.62
92	23.28	23.79	24.29	24.79	25.29	25.79	26.30	26.80	27.30	27.80	28.30	28.81	29.31	29.81	30.31	30.81	31.32	31.82	32.32	32.82	33.32	33.82	34.33	34.83	35.33	35.83	36.33	36.84
91	22.50	23.00	23.50	24.01	24.51	25.01	25.51	26.01	26.52	27.02	27.52	28.02	28.52	29.03	29.53	30.03	30.53	31.03	31.54	32.04	32.54	33.04	33.54	34.04	34.55	35.05	35.55	36.05
90	21.72	22.22	22.72	23.22	23.72	24.23	24.73	25.23	25.73	26.23	26.74	27.24	27.74	28.24	28.74	29.25	29.75	30.25	30.75	31.25	31.75	32.26	32.76	33.26	33.76	34.26	34.77	35.27
89	20.93	21.43	21.94	22.44	22.94	23.44	23.94	24.45	24.95	25.45	25.95	26.45	26.96	27.46	27.96	28.46	28.96	29.47	29.97	30.47	30.97	31.47	31.97	32.48	32.98	33.48	33.98	34.48
88	20.15	20.65	21.15	21.65	22.16	22.66	23.16	23.66	24.16	24.67	25.17	25.67	26.17	26.67	27.18	27.68	28.18	28.68	29.18	29.68	30.19	30.69	31.19	31.69	32.19	32.70	33.20	33.70
87	19.36	19.87	20.37	20.87	21.37	21.87	22.38	22.88	23.38	23.88	24.38	24.89	25.39	25.89	26.39	26.89	27.40	27.90	28.40	28.90	29.40	29.90	30.41	30.91	31.41	31.91	32.41	32.92
86	18.58	19.08	19.58	20.09	20.59	21.09	21.59	22.09	22.60	23.10	23.60	24.10	24.60	25.11	25.61	26.11	26.61	27.11	27.62	28.12	28.62	29.12	29.62	30.12	30.63	31.13	31.63	32.13
85	17.80	18.30	18.80	19.30	19.80	20.31	20.81	21.31	21.81	22.31	22.82	23.32	23.82	24.32	24.82	25.33	25.83	26.33	26.83	27.33	27.83	28.34	28.84	29.34	29.84	30.34	30.85	31.35
84	17.01	17.51	18.02	18.52	19.02	19.52	20.02	20.53	21.03	21.53	22.03	22.53	23.04	23.54	24.04	24.54	25.04	25.55	26.05	26.55	27.05	27.55	28.05	28.56	29.06	29.56	30.06	30.56
83	16.23	16.73	17.23	17.73	18.24	18.74	19.24	19.74	20.24	20.75	21.25	21.75	22.25	22.75	23.26	23.76	24.26	24.76	25.26	25.76	26.27	26.77	27.27	27.77	28.27	28.78	29.28	29.78
82	15.44	15.95	16.45	16.95	17.45	17.95	18.46	18.96	19.46	19.96	20.46	20.97	21.47	21.97	22.47	22.97	23.48	23.98	24.48	24.98	25.48	25.98	26.49	26.99	27.49	27.99	28.49	29.00
81	14.66	15.16	15.66	16.17	16.67	17.17	17.67	18.17	18.68	19.18	19.68	20.18	20.68	21.19	21.69	22.19	22.69	23.19	23.70	24.20	24.70	25.20	25.70	26.20	26.71	27.21	27.71	28.21
80	13.88	14.38	14.88	15.38	15.88	16.39	16.89	17.39	17.89	18.39	18.90	19.40	19.90	20.40	20.90	21.41	21.91	22.41	22.91	23.41	23.91	24.42	24.92	25.42	25.92	26.42	26.93	27.43
79	13.09	13.59	14.10	14.60	15.10	15.60	16.10	16.61	17.11	17.61	18.11	18.61	19.12	19.62	20.12	20.62	21.12	21.63	22.13	22.63	23.13	23.63	24.13	24.64	25.14	25.64	26.14	26.64
78	12.31	12.81	13.31	13.81	14.32	14.82	15.32	15.82	16.32	16.83	17.33	17.83	18.33	18.83	19.34	19.84	20.34	20.84	21.34	21.84	22.35	22.85	23.35	23.85	24.35	24.86	25.36	25.86
77	11.52	12.03	12.53	13.03	13.53	14.03	14.54	15.04	15.54	16.04	16.54	17.05	17.55	18.05	18.55	19.05	19.56	20.06	20.56	21.06	21.56	22.06	22.57	23.07	23.57	24.07	24.57	25.08
76	10.74	11.24	11.74	12.25	12.75	13.25	13.75	14.25	14.76	15.26	15.76	16.26	16.76	17.27	17.77	18.27	18.77	19.27	19.78	20.28	20.78	21.28	21.78	22.28	22.79	23.29	23.79	24.29
75	9.96	10.46	10.96	11.46	11.96	12.47	12.97	13.47	13.97	14.47	14.98	15.48	15.98	16.48	16.98	17.49	17.99	18.49	18.99	19.49	19.99	20.50	21.00	21.50	22.00	22.50	23.01	23.51
74	9.17	9.67	10.18	10.68	11.18	11.68	12.18	12.69	13.19	13.69	14.19	14.69	15.20	15.70	16.20	16.70	17.20	17.71	18.21	18.71	19.21	19.71	20.21	20.72	21.22	21.72	22.22	22.72
73	8.39	8.89	9.39	9.89	10.40	10.90	11.40	11.90	12.40	12.91	13.41	13.91	14.41	14.91	15.42	15.92	16.42	16.92	17.42	17.92	18.43	18.93	19.43	19.93	20.43	20.94	21.44	21.94
72	7.60	8.11	8.61	9.11	9.61	10.11	10.62	11.12	11.62	12.12	12.62	13.13	13.63	14.13	14.63	15.13	15.64	16.14	16.64	17.14	17.64	18.14	18.65	19.15	19.65	20.15	20.65	21.15
71	6.82	7.32	7.82	8.33	8.83	9.33	9.83	10.33	10.84	11.34	11.84	12.34	12.84	13.35	13.85	14.35	14.85	15.35	15.86	16.36	16.86	17.36	17.86	18.36	18.87	19.37	19.87	20.37
70	6.04	6.54	7.04	7.54	8.04	8.55	9.05	9.55	10.05	10.55	11.06	11.56	12.06	12.56	13.06	13.57	14.07	14.57	15.07	15.57	16.07	16.58	17.08	17.58	18.08	18.58	19.09	19.59
69	5.25	5.75	6.26	6.76	7.26	7.76	8.26	8.77	9.27	9.77	10.27	10.77	11.28	11.78	12.28	12.78	13.28	13.79	14.29	14.79	15.29	15.79	16.29	16.80	17.30	17.80	18.30	18.80
68	4.47	4.97	5.47	5.97	6.48	6.98	7.48	7.98	8.48	8.99	9.49	9.99	10.49	10.99	11.50	12.00	12.50	13.00	13.50	14.00	14.51	15.01	15.51	16.01	16.51	17.02	17.52	18.02
67	3.68	4.19	4.69	5.19	5.69	6.19	6.70	7.20	7.70	8.20	8.70	9.21	9.71	10.21	10.71	11.21	11.72	12.22	12.72	13.22	13.72	14.22	14.73	15.23	15.73	16.23	16.73	17.24
66	2.90	3.40	3.90	4.41	4.91	5.41	5.91	6.41	6.92	7.42	7.92	8.42	8.92	9.43	9.93	10.43	10.93	11.43	11.94	12.44	12.94	13.44	13.94	14.44	14.95	15.45	15.95	16.45

Interpolation Table

Chest Circumference	Knee 0
0	0
.1	.078
.2	.157
.3	.235
.4	.314
.5	.392
.6	.470
.7	.549
.8	.627
.9	.706

Table 48

Predicting Weight (Kilograms) of Boys, Age Seventeen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centi-meters	Hip Width, Centimeters																									
	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.4	32.8	33.2
194	47.37	47.65	47.93	48.22	48.50	48.78	49.07	49.35	49.63	49.92	50.20	50.48	50.77	51.05	51.33	51.62	51.90	52.18	52.47	52.75	53.03	53.32	53.60	53.88	54.17	54.45
193	47.08	47.36	47.64	47.93	48.21	48.49	48.78	49.06	49.34	49.63	49.91	50.19	50.48	50.76	51.04	51.33	51.61	51.89	52.18	52.46	52.74	53.03	53.31	53.59	53.88	54.16
192	46.79	47.07	47.35	47.64	47.92	48.20	48.49	48.77	49.05	49.34	49.62	49.90	50.19	50.47	50.75	51.04	51.32	51.60	51.89	52.17	52.45	52.74	53.02	53.30	53.59	53.87
191	46.50	46.78	47.06	47.35	47.63	47.91	48.20	48.48	48.76	49.05	49.33	49.61	49.90	50.18	50.46	50.75	51.03	51.31	51.60	51.88	52.16	52.45	52.73	53.01	53.30	53.58
190	46.21	46.49	46.77	47.06	47.34	47.62	47.91	48.19	48.47	48.76	49.04	49.32	49.61	49.89	50.17	50.46	50.74	51.02	51.31	51.59	51.87	52.16	52.44	52.72	53.01	53.29
189	45.92	46.20	46.48	46.77	47.05	47.33	47.62	47.90	48.18	48.47	48.75	49.03	49.32	49.60	49.88	50.17	50.45	50.73	51.02	51.30	51.58	51.87	52.15	52.43	52.72	53.00
188	45.63	45.91	46.20	46.48	46.76	47.05	47.33	47.61	47.89	48.18	48.46	48.74	49.03	49.31	49.59	49.88	50.16	50.44	50.73	51.01	51.29	51.58	51.86	52.14	52.43	52.71
187	45.34	45.62	45.91	46.19	46.47	46.76	47.04	47.32	47.61	47.89	48.17	48.46	48.74	49.02	49.30	49.59	49.87	50.15	50.44	50.72	51.00	51.29	51.57	51.85	52.14	52.42
186	45.05	45.33	45.62	45.90	46.18	46.47	46.75	47.03	47.32	47.60	47.88	48.17	48.45	48.73	49.02	49.30	49.58	49.87	50.15	50.43	50.71	51.00	51.28	51.56	51.85	52.13
185	44.76	45.04	45.33	45.61	45.89	46.18	46.46	46.74	47.03	47.31	47.59	47.88	48.16	48.44	48.73	49.01	49.29	49.58	49.86	50.14	50.43	50.71	50.99	51.27	51.56	51.84
184	44.47	44.75	45.04	45.32	45.60	45.89	46.17	46.45	46.74	47.02	47.30	47.59	47.87	48.15	48.44	48.72	49.00	49.29	49.57	49.85	50.14	50.42	50.70	50.99	51.27	51.55
183	44.18	44.46	44.75	45.03	45.31	45.60	45.88	46.16	46.45	46.73	47.01	47.30	47.58	47.86	48.15	48.43	48.71	49.00	49.28	49.56	49.85	50.13	50.41	50.70	50.98	51.26
182	43.39	44.17	44.46	44.74	45.02	45.31	45.59	45.87	46.16	46.44	46.72	47.01	47.29	47.57	47.86	48.14	48.42	48.71	48.99	49.27	49.56	49.84	50.12	50.41	50.69	50.97
181	43.60	43.88	44.17	44.45	44.73	45.02	45.30	45.58	45.87	46.15	46.43	46.72	47.00	47.28	47.57	47.85	48.13	48.42	48.70	48.98	49.27	49.55	49.83	50.12	50.40	50.68
180	43.31	43.59	43.88	44.16	44.44	44.73	45.01	45.29	45.58	45.86	46.14	46.43	46.71	46.99	47.28	47.56	47.34	48.13	48.41	48.69	48.98	49.26	49.54	49.83	50.11	50.39
179	43.02	43.30	43.59	43.87	44.15	44.44	44.72	45.00	45.29	45.57	45.85	46.14	46.42	46.70	46.99	47.27	47.55	47.84	48.13	48.40	48.69	48.97	49.25	49.54	49.82	50.10
178	42.73	43.01	43.30	43.58	43.86	44.15	44.43	44.71	45.00	45.28	45.56	45.85	46.13	46.41	46.70	46.98	47.26	47.55	47.83	48.11	48.40	48.68	48.96	49.25	49.53	49.81
177	42.44	42.73	43.01	43.29	43.58	43.85	44.14	44.42	44.71	44.99	45.27	45.56	45.84	46.12	46.41	46.69	46.97	47.26	47.54	47.82	48.11	48.39	48.67	48.96	49.24	49.52
176	42.15	42.44	42.72	43.00	43.29	43.57	43.85	44.14	44.42	44.70	44.99	45.27	45.55	45.83	46.12	46.40	46.68	46.97	47.25	47.53	47.82	48.10	48.38	48.67	48.95	49.23
175	41.86	42.15	42.43	42.71	43.00	43.28	43.56	43.85	44.13	44.41	44.70	44.98	45.26	45.55	45.83	46.11	46.40	46.68	46.96	47.24	47.53	47.81	48.09	48.38	48.66	48.94
174	41.57	41.86	42.14	42.42	42.71	42.99	43.27	43.56	43.84	44.12	44.41	44.69	44.97	45.26	45.54	45.82	46.11	46.39	46.67	46.96	47.24	47.52	47.81	48.09	48.37	48.65
173	41.28	41.57	41.85	42.13	42.42	42.70	42.98	43.27	43.55	43.83	44.12	44.40	44.68	44.97	45.25	45.53	45.82	46.10	46.38	46.67	46.95	47.23	47.52	47.80	48.08	48.37
172	40.99	41.28	41.56	41.84	42.13	42.41	42.69	42.98	43.26	43.54	43.83	44.11	44.39	44.68	44.96	45.24	45.53	45.81	46.09	46.38	46.66	46.94	47.23	47.51	47.79	48.08
171	40.70	40.99	41.27	41.55	41.84	42.12	42.40	42.69	42.97	43.25	43.54	43.82	44.10	44.39	44.67	44.95	45.24	45.52	45.80	46.09	46.37	46.65	46.94	47.22	47.50	47.79
170	40.41	40.70	40.98	41.26	41.55	41.83	42.11	42.40	42.68	42.96	43.25	43.53	43.81	44.10	44.38	44.66	44.95	45.23	45.51	45.80	46.08	46.36	46.65	46.93	47.21	47.50
169	40.12	40.41	40.69	40.97	41.26	41.54	41.82	42.11	42.39	42.67	42.96	43.24	43.52	43.81	44.09	44.37	44.66	44.94	45.22	45.51	45.79	46.07	46.36	46.64	46.92	47.21
168	39.83	40.12	40.40	40.68	40.97	41.25	41.53	41.82	42.10	42.38	42.67	42.95	43.23	43.52	43.80	44.08	44.37	44.65	44.93	45.22	45.50	45.78	46.07	46.35	46.63	46.92
167	39.54	39.83	40.11	40.39	40.68	40.96	41.24	41.53	41.81	42.09	42.38	42.66	42.94	43.23	43.51	43.79	44.08	44.36	44.64	44.93	45.21	45.49	45.78	46.06	46.34	46.63
166	39.26	39.54	39.82	40.11	40.39	40.67	40.95	41.24	41.52	41.80	42.09	42.37	42.65	42.94	43.22	43.50	43.79	44.07	44.35	44.64	44.92	45.20	45.49	45.77	46.05	46.34
165	38.97	39.25	39.53	39.82	40.10	40.38	40.67	40.95	41.23	41.52	41.80	42.08	42.36	42.65	42.93	43.21	43.50	43.78	44.06	44.35	44.63	44.91	45.20	45.48	45.76	46.05
164	38.68	38.96	39.24	39.53	39.81	40.09	40.38	40.66	40.94	41.23	41.51	41.79	42.08	42.36	42.64	42.93	43.21	43.49	43.77	44.06	44.34	44.62	44.91	45.19	45.47	45.76
163	38.39	38.67	38.95	39.24	39.52	39.80	40.09	40.37	40.65	40.94	41.22	41.50	41.79	42.07	42.35	42.64	42.92	43.20	43.49	43.77	44.05	44.34	44.62	44.90	45.18	45.47
162	38.10	38.38	38.66	38.95	39.23	39.51	39.80	40.08	40.36	40.65	40.93	41.21	41.50	41.78	42.06	42.35	42.63	42.91	43.20	43.48	43.76	44.05	44.33	44.61	44.90	45.18
161	37.81	38.09	38.37	38.66	38.94	39.22	39.51	39.79	40.07	40.36	40.64	40.92	41.21	41.49	41.77	42.06	42.34	42.62	42.91	43.19	43.47	43.76	44.04	44.32	44.61	44.89
160	37.52	37.80	38.08	38.37	38.65	38.93	39.22	39.50	39.87	40.07	40.35	40.63	40.92	41.20	41.48	41.77	42.05	42.33	42.62	42.90	43.18	43.47	43.75	44.03	44.32	44.60
159	37.23	37.51	37.79	38.08	38.36	38.64	38.93	39.21	39.49	39.78	40.06	40.34	40.63	40.91	41.19	41.48	41.76	42.04	42.33	42.61	42.89	43.18	43.46	43.74	44.03	44.31
158	36.94	37.22	37.50	37.79	38.07	38.35	38.64	38.92	39.20	39.49	39.77	40.05	40.34	40.62	40.90	41.19	41.47	41.75	42.04	42.32	42.60	42.89	43.17	43.45	43.74	44.02
157	36.65	36.93	37.21	37.50	37.78	38.06	38.35	38.63	38.91	39.20	39.48	39.76	40.05	40.33	40.61	40.90	41.18	41.46	41.75	42.03	42.31	42.60	42.88	43.16	43.45	43.73
156	36.36	36.64	36.92	37.21	37.49	37.77	38.06	38.34	38.62	38.91	39.19	39.47	39.76	40.04	42.32	40.61	40.89	41.17	41.46	41.74	42.02	42.31	42.59	42.87	43.16	43.44
155	36.07	36.35	36.64	36.92	37.20	37.48	37.77	38.05	38.33	38.62	38.90	39.18	39.47	39.75	40.03	40.32	40.60	40.88	41.17	41.45	41.73	42.02	42.30	42.58	42.87	43.15
154	35.78	36.06	36.35	36.63	36.91	37.20	37.48	37.76	38.05	38.33	38.61	38.89	39.18	39.46	39.74	40.03	40.31	40.59	40.88	41.16	41.44	41.73	42.01	42.29	42.58	42.86
153	35.49	35.77	36.06	36.34	36.62	36.91	37.19	37.47	37.76	38.04	38.32	38.61	38.89	39.17	39.46	39.74	40.02	40.30	40.59	40.87	41.15	41.44	41.72	42.00	42.29	42.57

Interpolation Table

Height	Hips			
	0	.1	.2	.3
0	0	.07	.14	.21
.1	.03	.10	.17	.24
.2	.06	.13	.20	.27
.3	.09	.16	.23	.30
.4	.12	.19	.26	.33
.5	.15	.22	.29	.36
.6	.17	.24	.32	.39
.7	.20	.27	.34	.42
.8	.23	.30	.37	.44
.9	.26	.33	.40	.47

Table 49

Predicting Weight (Kilograms) of Boys, Age Seventeen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																													
	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	11.0	11.1
99	23.10	23.60	24.10	24.60	25.10	25.60	26.10	26.61	27.11	27.61	28.11	28.61	29.11	29.61	30.12	30.62	31.12	31.62	32.12	32.62	33.12	33.63	34.13	34.63	35.13	35.63	36.13	36.64	37.14	37.64
98	22.37	22.87	23.37	23.87	24.37	24.88	25.38	25.88	26.38	26.88	27.38	27.88	28.39	28.89	29.39	29.89	30.39	30.89	31.40	31.90	32.40	32.90	33.40	33.90	34.40	34.91	35.41	35.91	36.41	36.91
97	21.64	22.14	22.64	23.15	23.65	24.15	24.65	25.15	25.65	26.15	26.66	27.16	27.66	28.16	28.66	29.16	29.67	30.17	30.67	31.17	31.67	32.17	32.67	33.18	33.68	34.18	34.68	35.18	35.68	36.19
96	20.91	21.42	21.92	22.42	22.92	23.42	23.92	24.42	24.93	25.43	25.93	26.43	26.93	27.43	27.94	28.44	28.94	29.44	29.94	30.44	30.94	31.45	31.95	32.45	32.95	33.45	33.95	34.45	34.96	35.46
95	20.19	20.69	21.19	21.69	22.19	22.69	23.20	23.70	24.20	24.70	25.20	25.70	26.21	26.71	27.21	27.71	28.21	28.71	29.21	29.72	30.22	30.72	31.22	31.72	32.22	32.72	33.23	33.73	34.23	34.73
94	19.46	19.96	20.46	20.96	21.47	21.97	22.47	22.97	23.47	23.97	24.48	24.98	25.48	25.98	26.48	26.98	27.48	27.99	28.49	28.99	29.49	29.99	30.49	30.99	31.50	32.00	32.50	33.00	33.50	34.00
93	18.73	19.23	19.74	20.24	20.74	21.24	21.74	22.24	22.75	23.25	23.75	24.25	24.75	25.25	25.75	26.26	26.76	27.26	27.76	28.26	28.76	29.26	29.77	30.27	30.77	31.27	31.77	32.27	32.77	33.28
92	18.01	18.51	19.01	19.51	20.01	20.51	21.02	21.52	22.02	22.52	23.02	23.52	24.02	24.53	25.03	25.53	26.03	26.53	27.03	27.53	28.04	28.54	29.04	29.54	30.04	30.54	31.04	31.55	32.05	32.55
91	17.28	17.78	18.28	18.78	19.29	19.79	20.29	20.79	21.29	21.79	22.29	22.80	23.30	23.80	24.30	24.80	25.30	25.80	26.31	26.81	27.31	27.81	28.31	28.81	29.31	29.82	30.32	30.82	31.32	31.82
90	16.55	17.05	17.56	18.06	18.56	19.06	19.56	20.06	20.56	21.07	21.57	22.07	22.57	23.07	23.57	24.07	24.59	25.08	25.58	26.08	26.58	27.08	27.58	28.09	28.59	29.09	29.59	30.09	30.59	31.10
89	15.83	16.33	16.83	17.33	17.83	18.33	18.83	19.34	19.84	20.34	20.84	21.34	21.84	22.34	22.85	23.35	23.85	24.35	24.85	25.35	25.85	26.36	26.86	27.36	27.86	28.36	28.86	29.37	29.87	30.37
88	15.10	15.60	16.10	16.60	17.10	17.61	18.11	18.61	19.11	19.61	20.11	20.61	21.12	21.62	22.12	22.62	23.12	23.62	24.13	24.63	25.13	25.63	26.13	26.63	27.13	27.64	28.14	28.64	29.14	29.64
87	14.37	14.87	15.37	15.88	16.38	16.88	17.38	17.88	18.38	18.88	19.39	19.89	20.39	20.89	21.39	21.89	22.40	22.90	23.40	23.90	24.40	24.90	25.40	25.91	26.41	26.91	27.41	27.91	28.41	28.91
86	13.64	14.15	14.65	15.15	15.65	16.15	16.65	17.15	17.66	18.16	18.66	19.16	19.66	20.16	20.67	21.17	21.67	22.17	22.67	23.17	23.67	24.18	24.68	25.18	25.68	26.18	26.68	27.18	27.69	28.19
85	12.92	13.42	13.92	14.42	14.92	15.42	15.93	16.43	16.93	17.43	17.93	18.43	18.94	19.44	19.94	20.44	20.94	21.44	21.94	22.45	22.95	23.45	23.95	24.45	24.95	25.45	25.96	26.45	26.95	27.46
84	12.19	12.69	13.19	13.69	14.20	14.70	15.20	15.70	16.20	16.70	17.21	17.71	18.21	18.71	19.21	19.71	20.21	20.72	21.22	21.72	22.22	22.72	23.22	23.72	24.23	24.73	25.23	25.73	26.23	26.73
83	11.46	11.96	12.47	12.97	13.47	13.97	14.47	14.97	15.48	15.98	16.48	16.98	17.48	17.98	18.48	18.99	19.49	19.99	20.49	20.99	21.49	21.99	22.50	23.00	23.50	24.00	24.50	25.00	25.50	26.01
82	10.74	11.24	11.74	12.24	12.74	13.24	13.75	14.25	14.75	15.25	15.75	16.25	16.75	17.26	17.76	18.26	18.76	19.26	19.76	20.26	20.77	21.27	21.77	22.27	22.77	23.27	23.77	24.28	24.78	25.28
81	10.01	10.51	11.01	11.51	12.02	12.52	13.02	13.52	14.02	14.52	15.02	15.53	16.03	16.53	17.03	17.53	18.03	18.53	19.04	19.54	20.04	20.54	21.04	21.54	22.04	22.55	23.05	23.55	24.05	24.55
80	9.28	9.78	10.29	10.79	11.29	11.79	12.29	12.79	13.29	13.80	14.30	14.80	15.30	15.80	16.30	16.80	17.31	17.81	18.31	18.81	19.31	19.81	20.31	20.82	21.32	21.82	22.32	22.82	23.32	23.83
79	8.56	9.06	9.56	10.06	10.56	11.06	11.56	12.07	12.57	13.07	13.57	14.07	14.57	15.07	15.58	16.09	16.59	17.09	17.59	18.08	18.58	19.09	19.59	20.09	20.59	21.09	21.59	22.10	22.60	23.10
78	7.83	8.33	8.83	9.33	9.83	10.34	10.84	11.34	11.84	12.34	12.84	13.34	13.85	14.35	14.85	15.35	15.85	16.35	16.86	17.36	17.86	18.36	18.86	19.36	19.86	20.37	20.87	21.37	21.87	22.37
77	7.10	7.60	8.10	8.61	9.11	9.61	10.11	10.61	11.11	11.61	12.12	12.62	13.12	13.62	14.12	14.62	15.13	15.63	16.13	16.63	17.13	17.63	18.13	18.64	19.14	19.64	20.14	20.64	21.14	21.64
76	6.37	6.88	7.38	7.88	8.38	8.88	9.38	9.88	10.39	10.89	11.39	11.89	12.39	12.89	13.40	13.90	14.40	14.90	15.40	15.90	16.40	16.91	17.41	17.91	18.41	18.91	19.41	19.91	20.42	20.92
75	5.65	6.15	6.65	7.15	7.65	8.15	8.66	9.16	9.66	10.16	10.66	11.16	11.67	12.17	12.67	13.17	13.67	14.17	14.67	15.18	15.68	16.18	16.68	17.18	17.68	18.18	18.69	19.19	19.69	20.19
74	4.92	5.42	5.92	6.42	6.93	7.43	7.93	8.43	8.93	9.43	9.94	10.44	10.94	11.44	11.94	12.44	12.94	13.45	13.95	14.45	14.95	15.45	15.95	16.45	16.96	17.46	17.96	18.46	18.96	19.46
73	4.19	4.69	5.20	5.70	6.20	6.70	7.20	7.70	8.21	8.71	9.21	9.71	10.21	10.71	11.21	11.72	12.22	12.72	13.22	13.72	14.22	14.72	15.23	15.73	16.23	16.73	17.23	17.73	18.23	18.74
72	3.47	3.97	4.47	4.97	5.47	5.97	6.48	6.98	7.48	7.98	8.48	8.98	9.48	9.99	10.49	10.99	11.49	11.99	12.49	12.99	13.50	14.00	14.50	15.00	15.50	16.00	16.50	17.01	17.51	18.01
71	2.74	3.24	3.74	4.24	4.75	5.25	5.75	6.25	6.75	7.25	7.75	8.26	8.76	9.26	9.76	10.26	10.76	11.26	11.77	12.27	12.77	13.27	13.77	14.27	14.77	15.28	15.78	16.28	16.78	17.29
70	2.01	2.51	3.02	3.52	4.02	4.52	5.02	5.52	6.02	6.53	7.03	7.53	8.03	8.53	9.03	9.53	10.04	10.54	11.04	11.54	12.04	12.54	13.04	13.55	14.05	14.55	15.05	15.55	16.05	16.56
69	1.29	1.79	2.29	2.79	3.29	3.79	4.29	4.80	5.30	5.80	6.30	6.80	7.30	7.80	8.31	8.81	9.31	9.81	10.31	10.81	11.31	11.82	12.32	12.82	13.32	13.82	14.32	14.83	15.33	15.83
68	.56	1.06	1.56	2.06	2.56	3.07	3.57	4.07	4.57	5.07	5.57	6.07	6.58	7.08	7.58	8.09	8.59	9.08	9.59	10.09	10.59	11.09	11.59	12.09	12.59	13.10	13.60	14.10	14.60	15.10
67	-.17	.33	.83	1.34	1.84	2.34	2.84	3.34	3.84	4.34	4.85	5.35	5.85	6.35	6.85	7.35	7.86	8.36	8.86	9.36	9.86	10.36	10.86	11.37	11.87	12.37	12.97	13.37	13.97	14.37

Interpolation Table

Chest Circumference	Knee 0
0	0
.1	.073
.2	.145
.3	.218
.4	.291
.5	.364
.6	.436
.7	.509
.8	.582
.9	.654

Table 50

Predicting Weight of College Men from Height and Chest Circumference
(.2359 Height +.9641 Chest -100.00)

Height	Chest Circumference																		
	70.5	72.0	73.5	75.0	76.5	78.0	79.5	81.0	82.5	84.0	85.5	87.0	88.5	90.0	91.5	93.0	94.5	96.0	97.5
194	13.73	15.18	16.63	18.07	19.52	20.96	22.41	23.86	25.30	26.75	28.20	29.64	31.09	32.53	33.98	35.43	36.87	38.32	39.76
192	13.26	14.71	16.15	17.60	19.05	20.49	21.94	23.38	24.83	26.28	27.72	29.17	30.62	32.06	33.51	34.95	36.40	37.85	39.29
190	12.79	14.24	15.68	17.13	18.57	20.02	21.47	22.91	24.36	25.81	27.25	28.70	30.14	31.59	33.04	34.48	35.93	37.37	38.82
188	12.32	13.76	15.21	16.66	18.10	19.55	21.00	22.44	23.89	25.33	26.78	28.23	29.67	31.12	32.56	34.01	35.46	36.90	38.35
186	11.85	13.29	14.74	16.18	17.63	19.08	20.52	21.97	23.42	24.86	26.31	27.75	29.20	30.65	32.09	33.54	34.98	36.43	37.88
184	11.37	12.82	14.27	15.71	17.16	18.61	20.05	21.50	22.94	24.39	25.84	27.28	28.73	30.17	31.62	33.07	34.51	35.96	37.41
182	10.90	12.35	13.80	15.24	16.69	18.13	19.58	21.03	22.47	23.92	25.36	26.81	28.26	29.70	31.15	32.60	34.04	35.49	36.93
180	10.43	11.78	13.32	14.77	16.22	17.66	19.11	20.55	20.00	23.45	24.89	26.34	27.78	29.23	30.68	32.12	33.57	35.02	36.46
178	9.96	11.41	12.85	14.30	15.74	17.19	18.64	20.08	21.53	22.97	24.42	25.87	27.31	28.76	30.21	31.65	33.10	34.54	35.99
176	9.49	10.93	12.38	13.83	15.27	16.72	18.16	19.61	21.06	22.50	23.95	25.40	26.84	28.29	29.73	31.18	32.63	34.07	35.52
174	9.02	10.46	11.91	13.35	14.80	16.25	17.69	19.14	20.58	22.03	23.48	24.92	26.37	27.82	29.26	30.71	32.15	33.60	35.05
172	8.54	9.99	11.44	12.88	14.33	15.77	17.22	18.67	20.11	21.56	23.01	24.45	25.90	27.34	28.79	30.24	31.68	33.13	34.57
170	8.07	9.52	10.96	12.41	13.86	15.30	16.75	18.20	19.64	21.09	22.53	23.98	25.43	26.87	28.32	29.76	31.21	32.66	34.10
168	7.60	9.05	10.49	11.94	13.38	14.83	16.28	17.72	19.17	20.62	22.06	23.51	24.95	26.40	27.85	29.29	30.74	32.18	33.63
166	7.13	8.57	10.02	11.47	12.91	14.36	15.81	17.25	18.70	20.14	21.59	23.04	24.43	25.93	27.37	28.82	30.27	31.71	33.16
164	6.66	8.10	9.55	11.00	12.44	13.89	15.33	16.78	18.23	19.67	21.12	22.56	24.01	25.46	26.90	28.35	29.80	31.24	32.69
162	6.18	7.63	9.08	10.52	11.97	13.42	14.86	16.31	17.75	19.20	20.65	22.09	23.54	24.98	26.43	27.88	29.32	30.77	32.22
160	5.71	7.16	8.61	10.05	11.50	12.94	14.39	15.84	17.28	18.73	20.17	21.62	23.07	24.51	25.96	27.41	28.85	30.30	31.74
158	5.24	6.69	8.13	9.58	10.03	12.47	13.92	15.36	16.81	18.26	19.70	21.15	22.60	24.04	25.49	26.93	28.38	29.83	31.27
156	4.77	6.22	7.66	9.11	10.55	12.00	13.45	14.89	16.34	17.78	19.23	20.68	22.12	23.57	25.02	26.46	27.91	29.35	30.80

Interpolation Table

Height	Chest Circumference, Centimeters														
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4
0	0	.10	.19	.29	.39	.48	.58	.67	.77	.87	.96	1.06	1.16	1.25	1.35
.1	.02	.12	.22	.31	.41	.51	.60	.70	.79	.89	.99	1.08	1.18	1.28	1.37
.2	.05	.14	.24	.34	.43	.53	.63	.72	.82	.91	1.01	1.11	1.20	1.30	1.40
.3	.07	.17	.26	.36	.46	.55	.65	.75	.84	.94	1.03	1.13	1.23	1.32	1.42
.4	.09	.19	.29	.38	.48	.58	.67	.77	.87	.96	1.06	1.15	1.25	1.35	1.44
.5	.12	.21	.31	.41	.50	.60	.70	.79	.89	.99	1.08	1.18	1.27	1.37	1.47
.6	.14	.24	.33	.43	.53	.62	.72	.82	.91	1.01	1.11	1.20	1.30	1.39	1.49
.7	.17	.26	.36	.45	.55	.65	.74	.84	.94	1.03	1.13	1.23	1.32	1.42	1.51
.8	.19	.29	.38	.48	.57	.67	.77	.86	.96	1.06	1.15	1.25	1.35	1.44	1.54
.9	.21	.31	.41	.50	.60	.69	.79	.89	.98	1.08	1.18	1.27	1.37	1.47	1.56
1.0	.24	.33	.43	.53	.62	.72	.81	.91	1.01	1.10	1.20	1.30	1.39	1.49	1.59
1.1	.26	.36	.45	.55	.65	.74	.84	.93	1.03	1.13	1.22	1.32	1.42	1.51	1.61
1.2	.28	.38	.48	.57	.67	.77	.86	.96	1.05	1.15	1.25	1.34	1.44	1.54	1.63
1.3	.31	.40	.50	.60	.69	.79	.89	.98	1.08	1.17	1.27	1.37	1.46	1.56	1.66
1.4	.33	.43	.52	.62	.72	.81	.91	1.01	1.10	1.20	1.29	1.39	1.49	1.58	1.68
1.5	.35	.45	.55	.64	.74	.84	.93	1.03	1.13	1.22	1.32	1.41	1.51	1.61	1.70
1.6	.37	.47	.57	.67	.76	.86	.96	1.05	1.15	1.25	1.34	1.44	1.53	1.63	1.73
1.7	.40	.50	.59	.69	.79	.88	.98	1.08	1.17	1.27	1.37	1.46	1.56	1.65	1.75
1.8	.42	.52	.62	.71	.81	.91	1.00	1.10	1.20	1.29	1.39	1.49	1.58	1.68	1.77
1.9	.45	.54	.64	.74	.83	.93	1.03	1.12	1.22	1.32	1.41	1.51	1.61	1.70	1.80

Table 51

Predicting Weight of College Men from Width of Hips and Knee
(2.4796 Knee +1.1402 Hips -12.7968)

Knee	Hips																					
	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.4	32.8	33.2
11.6	44.24	44.70	45.16	45.61	46.07	46.52	46.98	47.44	47.89	48.35	48.30	49.26	49.72	50.17	50.63	51.08	51.54	52.00	52.45	52.91	53.37	53.82
11.4	43.75	44.20	44.66	45.12	45.57	46.03	46.48	46.94	47.40	47.85	48.31	48.76	49.22	49.68	50.13	50.59	51.04	51.50	51.96	52.41	52.87	53.33
11.2	43.25	43.71	44.16	44.62	45.08	45.53	45.99	46.44	46.90	47.36	47.81	48.27	48.72	49.18	49.64	50.09	50.55	51.01	51.46	51.92	52.37	52.83
11.0	42.76	43.21	43.67	44.12	44.58	45.09	45.49	45.95	46.40	46.86	47.32	47.77	48.23	48.68	49.14	49.60	50.05	50.51	50.97	51.42	51.88	52.33
10.8	42.26	42.72	43.17	43.63	44.08	44.54	45.00	45.45	45.91	46.36	46.82	47.28	47.73	48.19	48.64	49.10	49.56	50.01	50.47	50.93	51.38	51.84
10.6	41.76	42.22	42.68	43.13	43.59	44.04	44.50	44.96	45.41	45.87	46.32	46.78	47.24	47.69	48.15	48.61	49.06	49.52	49.97	50.43	50.89	51.34
10.4	41.27	41.72	42.18	42.64	43.09	43.55	44.00	44.46	44.92	45.37	45.83	46.28	46.74	47.20	47.65	48.11	48.57	49.02	49.48	49.93	50.39	50.85
10.2	40.77	41.23	41.68	42.14	42.60	43.05	43.51	43.96	44.42	44.88	45.33	45.79	46.25	46.70	47.16	47.61	48.07	48.53	48.98	49.44	49.89	50.35
10.0	40.28	40.73	41.19	41.64	42.10	42.56	43.01	43.47	43.92	44.38	44.84	45.29	45.75	46.21	46.66	47.12	47.57	48.03	48.99	48.94	49.40	49.85
9.8	39.78	40.24	40.69	41.15	41.60	42.06	42.52	42.97	43.43	43.88	44.34	44.80	45.25	45.71	46.17	46.62	47.08	47.53	47.99	48.45	48.90	49.36
9.6	39.28	39.74	40.20	40.65	41.11	41.56	42.02	42.48	42.93	43.39	43.85	44.30	44.76	45.21	45.67	46.13	46.58	47.01	47.49	47.95	48.41	48.86
9.4	38.79	39.24	39.70	40.16	40.61	41.07	41.52	41.98	42.44	42.39	43.35	43.81	44.26	44.72	45.17	45.63	46.09	46.54	47.00	47.45	47.91	48.37
9.2	38.29	38.75	39.20	39.66	40.12	40.57	41.03	41.49	41.94	42.40	42.85	43.31	43.77	44.22	44.68	45.13	45.59	46.05	46.50	46.96	47.41	47.87
9.0	37.80	38.25	38.71	39.16	39.62	40.08	40.53	40.99	41.45	41.90	42.36	42.81	43.27	43.73	44.18	44.64	45.09	45.55	46.01	46.46	46.92	47.37
8.8	37.30	37.76	38.21	38.67	39.12	39.58	40.04	40.49	40.95	41.41	41.86	42.32	42.77	43.23	43.69	44.14	44.60	45.05	45.51	45.97	46.42	46.88
8.6	36.80	37.26	37.72	38.17	38.63	39.09	39.54	40.00	40.45	40.91	41.37	41.82	42.28	42.73	43.19	43.65	44.10	44.56	45.01	45.47	45.93	46.38
8.4	36.31	36.76	37.22	37.68	38.13	38.59	39.05	39.50	39.96	40.41	40.87	41.33	41.78	42.29	42.69	43.15	43.61	44.06	44.52	44.97	45.43	45.89
8.2	35.81	36.27	36.73	37.18	37.64	38.09	38.55	39.01	39.46	39.92	40.37	40.83	41.29	41.74	42.20	42.65	43.11	43.57	44.02	44.48	44.93	45.39
8.0	35.32	35.77	36.23	36.69	37.14	37.60	38.05	38.51	38.97	39.42	39.88	40.33	40.79	41.25	41.70	42.16	42.61	43.07	43.53	43.98	44.44	44.89

Interpolation Table

Knee	Hips			
	0	.1	.2	.3
0	0	.11	.23	.34
.1	.25	.36	.48	.59

Table 52

Predicting Weight (Kilograms) of Girls, Age Four Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1298 height + .3304 hips + .4819 chest circumference + .7320 knee - 32.0532: R = .9636)

Height, Centimeters	Hip Width, Centimeters																										
	15.4	15.6	15.8	16.0	16.2	16.4	16.6	16.8	17.0	17.2	17.4	17.6	17.8	18.0	18.2	18.4	18.6	18.8	19.0	19.2	19.4	19.6	19.8	20.0	20.2	20.4	20.6
119	13.45	13.51	13.58	13.65	13.72	13.78	13.85	13.91	13.98	14.05	14.11	14.18	14.24	14.31	14.38	14.44	14.51	14.57	14.64	14.71	14.77	14.84	14.90	14.97	15.04	15.10	15.17
118	13.32	13.39	13.45	13.52	13.59	13.65	13.72	13.78	13.85	13.92	13.98	14.05	14.11	14.18	14.25	14.31	14.38	14.44	14.51	14.58	14.64	14.71	14.78	14.84	14.91	14.97	15.04
117	13.19	13.26	13.32	13.39	13.46	13.52	13.59	13.65	13.72	13.79	13.85	13.92	13.98	14.05	14.12	14.18	14.25	14.31	14.38	14.45	14.51	14.58	14.65	14.71	14.78	14.84	14.91
116	13.06	13.13	13.19	13.26	13.33	13.39	13.46	13.52	13.59	13.66	13.72	13.79	13.85	13.92	13.99	14.05	14.12	14.19	14.25	14.32	14.38	14.45	14.52	14.58	14.65	14.71	14.78
115	12.93	13.00	13.06	13.13	13.20	13.26	13.33	13.39	13.46	13.53	13.59	13.66	13.72	13.79	13.86	13.92	13.99	14.06	14.12	14.19	14.25	14.32	14.39	14.45	14.52	14.58	14.65
114	12.80	12.87	12.93	13.00	13.07	13.13	13.20	13.26	13.33	13.40	13.46	13.53	13.60	13.66	13.73	13.79	13.86	13.93	13.99	14.06	14.12	14.19	14.26	14.32	14.39	14.45	14.52
113	12.67	12.74	12.80	12.87	12.94	13.00	13.07	13.13	13.20	13.27	13.33	13.40	13.47	13.53	13.60	13.66	13.73	13.80	13.86	13.93	13.99	14.06	14.13	14.19	14.26	14.32	14.39
112	12.54	12.61	12.67	12.74	12.81	12.87	12.94	13.01	13.07	13.14	13.20	13.27	13.34	13.40	13.47	13.53	13.60	13.67	13.73	13.80	13.86	13.93	14.00	14.06	14.13	14.19	14.25
111	12.41	12.48	12.54	12.61	12.68	12.74	12.81	12.88	12.94	13.01	13.07	13.14	13.21	13.27	13.34	13.40	13.47	13.54	13.60	13.67	13.73	13.80	13.87	13.93	14.00	14.06	14.13
110	12.28	12.35	12.42	12.48	12.55	12.61	12.68	12.75	12.81	12.88	12.94	13.01	13.08	13.14	13.21	13.27	13.34	13.41	13.47	13.54	13.60	13.67	13.74	13.80	13.87	13.93	14.00
109	12.15	12.22	12.29	12.35	12.42	12.48	12.55	12.62	12.68	12.75	12.81	12.88	12.95	13.01	13.08	13.14	13.21	13.28	13.34	13.41	13.47	13.54	13.61	13.67	13.74	13.81	13.87
108	12.02	12.09	12.16	12.22	12.29	12.35	12.42	12.49	12.55	12.62	12.68	12.75	12.82	12.88	12.95	13.01	13.08	13.15	13.21	13.28	13.34	13.41	13.48	13.54	13.61	13.68	13.74
107	11.89	11.96	12.03	12.09	12.16	12.22	12.29	12.36	12.42	12.49	12.55	12.62	12.69	12.75	12.82	12.88	12.95	13.02	13.08	13.15	13.22	13.28	13.35	13.41	13.48	13.55	13.61
106	11.76	11.83	11.90	11.96	12.03	12.09	12.16	12.23	12.29	12.36	12.42	12.49	12.56	12.62	12.69	12.75	12.82	12.89	12.95	13.02	13.09	13.15	13.22	13.28	13.35	13.42	13.49
105	11.63	11.70	11.77	11.83	11.90	11.96	12.03	12.10	12.16	12.23	12.29	12.36	12.43	12.49	12.56	12.63	12.69	12.76	12.82	12.89	12.96	13.02	13.09	13.15	13.22	13.29	13.35
104	11.50	11.57	11.64	11.70	11.77	11.83	11.90	11.97	12.03	12.10	12.16	12.23	12.30	12.36	12.43	12.50	12.56	12.63	12.69	12.76	12.83	12.89	12.96	13.02	13.09	13.16	13.22
103	11.37	11.44	11.51	11.57	11.64	11.70	11.77	11.84	11.90	11.97	12.04	12.10	12.17	12.23	12.30	12.37	12.43	12.50	12.56	12.63	12.70	12.76	12.83	12.89	12.96	13.03	13.09
102	11.24	11.31	11.38	11.44	11.51	11.57	11.64	11.71	11.77	11.84	11.91	11.97	12.04	12.10	12.17	12.24	12.30	12.37	12.43	12.50	12.57	12.63	12.70	12.76	12.83	12.90	12.96
101	11.11	11.16	11.25	11.31	11.38	11.45	11.51	11.58	11.64	11.71	11.78	11.84	11.91	11.97	12.04	12.11	12.17	12.24	12.30	12.37	12.44	12.50	12.57	12.63	12.70	12.77	12.83
100	10.98	11.05	11.12	11.18	11.25	11.32	11.38	11.45	11.51	11.58	11.65	11.71	11.78	11.84	11.91	11.98	12.04	12.11	12.17	12.24	12.31	12.37	12.44	12.50	12.57	12.64	12.70
99	10.66	10.92	10.99	11.05	11.12	11.19	11.25	11.32	11.38	11.45	11.52	11.58	11.65	11.71	11.78	11.85	11.91	11.98	12.04	12.11	12.18	12.24	12.31	12.37	12.44	12.51	12.57
98	10.73	10.79	10.86	10.92	10.99	11.06	11.12	11.19	11.25	11.32	11.39	11.45	11.52	11.58	11.65	11.72	11.78	11.85	11.91	11.98	12.05	12.11	12.18	12.25	12.31	12.38	12.44
97	10.60	10.66	10.73	10.79	10.86	10.93	10.99	11.06	11.12	11.19	11.26	11.32	11.39	11.45	11.52	11.59	11.65	11.72	11.79	11.85	11.92	11.98	12.05	12.12	12.18	12.25	12.31
96	10.47	10.53	10.60	10.66	10.73	10.80	10.86	10.93	10.99	11.06	11.13	11.19	11.26	11.32	11.39	11.46	11.52	11.59	11.66	11.72	11.79	11.85	11.92	11.99	12.05	12.12	12.18
95	10.34	10.40	10.47	10.53	10.60	10.67	10.73	10.80	10.86	10.93	11.00	11.06	11.13	11.20	11.26	11.33	11.39	11.46	11.53	11.59	11.66	11.72	11.79	11.86	11.92	11.99	12.05
94	10.21	10.27	10.34	10.40	10.47	10.54	10.60	10.67	10.73	10.80	10.87	10.93	11.00	11.07	11.13	11.20	11.26	11.33	11.40	11.46	11.53	11.59	11.66	11.73	11.79	11.86	11.92
93	10.08	10.14	10.21	10.27	10.34	10.41	10.47	10.54	10.61	10.67	10.74	10.80	10.87	10.94	11.00	11.07	11.13	11.20	11.27	11.33	11.40	11.46	11.53	11.60	11.66	11.73	11.79
92	9.95	10.01	10.18	10.14	10.21	10.28	10.34	10.41	10.48	10.54	10.61	10.67	10.74	10.81	10.87	10.94	11.00	11.07	11.14	11.20	11.27	11.33	11.40	11.47	11.53	11.60	11.66
91	9.82	9.88	9.95	10.02	10.08	10.15	10.21	10.28	10.35	10.41	10.48	10.54	10.61	10.68	10.74	10.81	10.87	10.94	11.01	11.07	11.14	11.20	11.27	11.34	11.40	11.47	11.53

Interpolation Table

Height	Hips 0	.1
0	0	.02
.1	.01	.03
.2	.03	.05
.3	.04	.06
.4	.05	.07
.5	.07	.09
.6	.08	.10
.7	.09	.11
.8	.10	.13
.9	.12	.14

Table 53

Predicting Weight (Kilograms) of Girls, Age Four Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference	Knee Width, Centimeters																									
	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1
57.2	6.66	6.74	6.81	6.88	6.96	7.03	7.10	7.18	7.25	7.32	7.40	7.47	7.54	7.62	7.69	7.76	7.84	7.91	7.98	8.05	8.13	8.20	8.27	8.35	8.42	8.49
56.8	6.47	6.54	6.61	6.69	6.76	6.84	6.91	6.98	7.06	7.13	7.20	7.28	7.35	7.42	7.50	7.57	7.64	7.72	7.79	7.86	7.94	8.01	8.08	8.15	8.23	8.30
56.4	6.28	6.35	6.42	6.50	6.57	6.64	6.72	6.79	6.86	6.93	7.01	7.08	7.16	7.23	7.30	7.38	7.45	7.52	7.60	7.67	7.74	7.82	7.89	7.96	8.04	8.11
56.0	6.09	6.16	6.23	6.31	6.38	6.45	6.52	6.60	6.67	6.74	6.82	6.89	6.96	7.04	7.11	7.18	7.26	7.33	7.40	7.47	7.55	7.62	7.70	7.77	7.84	7.92
55.6	5.89	5.97	6.04	6.11	6.19	6.26	6.33	6.41	6.48	6.55	6.62	6.70	6.77	6.84	6.92	6.99	7.06	7.14	7.21	7.28	7.36	7.43	7.50	7.58	7.65	7.72
55.2	5.70	5.77	5.85	5.92	5.99	6.07	6.14	6.21	6.29	6.36	6.43	6.51	6.58	6.65	6.72	6.80	6.87	6.94	7.02	7.09	7.16	7.24	7.31	7.38	7.46	7.53
54.8	5.51	5.58	5.65	5.73	5.80	5.87	5.95	6.02	6.09	6.17	6.24	6.31	6.39	6.46	6.53	6.61	6.68	6.75	6.82	6.90	6.97	7.04	7.12	7.19	7.26	7.34
54.4	5.31	5.39	5.46	5.53	5.61	5.68	5.75	5.83	5.90	5.97	6.05	6.12	6.19	6.27	6.34	6.41	6.49	6.56	6.63	6.71	6.78	6.85	6.92	7.00	7.07	7.14
54.0	5.12	5.20	5.27	5.34	5.41	5.49	5.56	5.63	5.71	5.78	5.85	5.93	6.00	6.07	6.15	6.22	6.29	6.37	6.44	6.51	6.59	6.66	6.73	6.81	6.88	6.95
53.6	4.93	5.00	5.08	5.15	5.22	5.30	5.37	5.44	5.51	5.59	5.66	5.73	5.81	5.88	5.95	6.03	6.10	6.17	6.25	6.32	6.39	6.47	6.54	6.61	6.69	6.76
53.2	4.74	4.81	4.88	4.96	5.03	5.10	5.18	5.25	5.32	5.40	5.47	5.54	5.61	5.69	5.76	5.83	5.91	5.98	6.05	6.13	6.20	6.27	6.35	6.42	6.49	6.57
52.8	4.54	4.62	4.69	4.76	4.84	4.91	4.98	5.06	5.13	5.20	5.28	5.35	5.42	5.50	5.57	5.64	5.71	5.79	5.86	5.93	6.01	6.08	6.15	6.23	6.30	6.37
52.4	4.35	4.42	4.50	4.57	4.64	4.72	4.79	4.86	4.94	5.01	5.08	5.16	5.23	5.30	5.38	5.45	5.52	5.60	5.67	5.74	5.81	5.89	5.96	6.03	6.11	6.18
52.0	4.16	4.23	4.30	4.38	4.45	4.52	4.60	4.67	4.74	4.82	4.89	4.96	5.04	5.11	5.19	5.26	5.33	5.40	5.48	5.55	5.62	5.70	5.77	5.84	5.91	5.99
51.6	3.97	4.04	4.11	4.18	4.26	4.33	4.40	4.48	4.55	4.62	4.70	4.77	4.84	4.92	4.99	5.06	5.14	5.21	5.28	5.36	5.43	5.50	5.58	5.65	5.72	5.80
51.2	3.77	3.85	3.92	3.99	4.07	4.14	4.21	4.28	4.36	4.43	4.50	4.58	4.65	4.72	4.80	4.87	4.94	5.02	5.09	5.16	5.24	5.31	5.38	5.46	5.53	5.60
50.8	3.58	3.65	3.73	3.80	3.87	3.95	4.02	4.09	4.17	4.24	4.31	4.38	4.46	4.53	4.60	4.68	4.75	4.82	4.90	4.97	5.04	5.12	5.19	5.26	5.34	5.41
50.4	3.39	3.46	3.53	3.61	3.68	3.75	3.83	3.90	3.97	4.05	4.12	4.19	4.27	4.34	4.41	4.48	4.56	4.63	4.70	4.78	4.85	4.92	5.00	5.07	5.14	5.22
50.0	3.19	3.27	3.34	3.41	3.49	3.56	3.63	3.71	3.78	3.85	3.93	4.00	4.07	4.15	4.22	4.29	4.37	4.44	4.51	4.59	4.66	4.73	4.80	4.88	4.95	5.02
49.6	3.00	3.07	3.15	3.22	3.29	3.37	3.44	3.51	3.59	3.66	3.73	3.81	3.88	3.95	4.03	4.10	4.17	4.25	4.32	4.39	4.47	4.54	4.61	4.69	4.76	4.83
49.2	2.81	2.88	2.96	3.03	3.10	3.17	3.25	3.32	3.39	3.47	3.54	3.61	3.69	3.76	3.83	3.91	3.98	4.05	4.13	4.20	4.27	4.35	4.42	4.49	4.57	4.64
48.8	2.62	2.69	2.76	2.84	2.91	2.98	3.06	3.13	3.20	3.27	3.35	3.42	3.49	3.57	3.64	3.71	3.79	3.86	3.93	4.01	4.08	4.15	4.23	4.30	4.37	4.45
48.4	2.42	2.50	2.57	2.64	2.72	2.79	2.86	2.94	3.01	3.08	3.16	3.23	3.30	3.37	3.45	3.52	3.59	3.67	3.74	3.81	3.89	3.96	4.03	4.11	4.18	4.25
48.0	2.23	2.30	2.38	2.45	2.52	2.60	2.67	2.74	2.82	2.89	2.96	3.04	3.11	3.18	3.26	3.33	3.40	3.47	3.55	3.62	3.69	3.77	3.84	3.91	3.99	4.06
47.6	2.04	2.11	2.18	2.26	2.33	2.40	2.48	2.55	2.62	2.70	2.77	2.84	2.92	2.99	3.06	3.14	3.21	3.28	3.36	3.43	3.50	3.57	3.65	3.72	3.79	3.87
47.2	1.84	1.92	1.99	2.06	2.14	2.21	2.28	2.36	2.43	2.50	2.58	2.65	2.72	2.80	2.87	2.94	3.02	3.09	3.16	3.24	3.31	3.38	3.46	3.53	3.60	3.67
46.8	1.65	1.73	1.80	1.87	1.94	2.02	2.09	2.16	2.24	2.31	2.38	2.46	2.53	2.60	2.68	2.75	2.82	2.90	2.97	3.04	3.12	3.19	3.26	3.34	3.41	3.48
46.4	1.46	1.53	1.61	1.68	1.75	1.83	1.90	1.97	2.04	2.12	2.19	2.26	2.33	2.41	2.48	2.56	2.63	2.70	2.78	2.85	2.92	3.00	3.07	3.14	3.22	3.29
46.0	1.27	1.34	1.41	1.49	1.56	1.63	1.71	1.78	1.85	1.93	2.00	2.07	2.15	2.22	2.29	2.36	2.44	2.51	2.58	2.66	2.73	2.80	2.88	2.95	3.02	3.10

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.05
.2	.10
.3	.14

Table 54

Predicting Weight (Kilograms) of Girls, Age Five Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1502 height + .3327 hips + .4730 chest circumference + 1.1673 knee - 36.9006; R = .9442)

Height, Centimeters	Hip Width, Centimeters																						
	15.3	15.6	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9
133.5	13.24	13.34	13.44	13.54	13.64	13.74	13.84	13.94	14.04	14.14	14.24	14.34	14.44	14.54	14.64	14.74	14.84	14.94	15.04	15.14	15.24	15.34	15.44
132.0	13.02	13.12	13.22	13.32	13.42	13.52	13.61	13.71	13.81	13.91	14.01	14.11	14.21	14.31	14.41	14.51	14.61	14.71	14.81	14.91	15.01	15.11	15.21
130.5	12.79	12.89	12.99	13.09	13.19	13.29	13.39	13.49	13.59	13.69	13.79	13.89	13.99	14.09	14.19	14.29	14.39	14.49	14.59	14.69	14.79	14.89	14.99
129.0	12.57	12.67	12.77	12.86	12.96	13.06	13.16	13.26	13.36	13.46	13.56	13.66	13.76	13.86	13.96	14.06	14.16	14.26	14.36	14.46	14.56	14.65	14.76
127.5	12.34	12.44	12.54	12.64	12.74	12.84	12.94	13.04	13.14	13.24	13.34	13.44	13.54	13.64	13.74	13.84	13.94	14.04	14.14	14.24	14.34	14.44	14.54
126.0	12.01	12.21	12.31	12.41	12.51	12.61	12.71	12.81	12.91	13.01	13.11	13.21	13.31	13.41	13.51	13.61	13.71	13.81	13.91	14.01	14.11	14.21	14.31
124.5	11.89	11.99	12.09	12.19	12.29	12.39	12.49	12.59	12.69	12.79	12.89	12.99	13.09	13.19	13.29	13.39	13.49	13.59	13.69	13.79	13.89	13.99	14.09
123.0	11.66	11.76	11.86	11.96	12.06	12.16	12.26	12.36	12.46	12.56	12.66	12.76	12.86	12.96	13.06	13.16	13.26	13.36	13.46	13.56	13.66	13.76	13.86
121.5	11.44	11.54	11.64	11.74	11.84	11.94	12.04	12.14	12.24	12.34	12.44	12.54	12.64	12.74	12.84	12.94	13.04	13.14	13.24	13.34	13.44	13.54	13.63
120.0	11.21	11.31	11.41	11.51	11.61	11.71	11.81	11.91	12.01	12.11	12.21	12.31	12.41	12.51	12.61	12.71	12.81	12.91	13.01	13.11	13.21	13.31	13.41
118.5	10.99	11.09	11.19	11.29	11.39	11.49	11.59	11.69	11.79	11.89	11.99	12.09	12.19	12.29	12.39	12.49	12.59	12.69	12.78	12.88	12.98	13.08	13.18
117.0	10.76	10.86	10.96	11.06	11.16	11.26	11.36	11.46	11.56	11.66	11.76	11.86	11.96	12.06	12.16	12.26	12.36	12.46	12.56	12.66	12.76	12.86	12.96
115.5	10.54	10.64	10.74	10.84	10.94	11.04	11.14	11.24	11.34	11.44	11.54	11.64	11.74	11.84	11.94	12.03	12.13	12.23	12.33	12.43	12.53	12.63	12.73
114.0	10.31	10.41	10.51	10.61	10.71	10.81	10.91	11.01	11.11	11.21	11.31	11.41	11.51	11.61	11.71	11.81	11.91	12.01	12.11	12.21	12.31	12.41	12.51
112.5	10.09	10.19	10.29	10.39	10.49	10.59	10.69	10.79	10.89	10.99	11.09	11.19	11.28	11.38	11.48	11.58	11.68	11.78	11.88	11.98	12.08	12.18	12.28
111.0	9.86	9.96	10.06	10.16	10.26	10.36	10.46	10.56	10.66	10.76	10.86	10.96	11.06	11.16	11.26	11.36	11.46	11.56	11.66	11.76	11.86	11.96	12.06
109.5	9.64	9.74	9.84	9.94	10.04	10.14	10.24	10.34	10.44	10.53	10.63	10.73	10.83	10.93	11.03	11.13	11.23	11.33	11.43	11.53	11.63	11.73	11.83
108.0	9.41	9.51	9.61	9.71	9.81	9.91	10.01	10.11	10.21	10.31	10.41	10.51	10.61	10.71	10.81	10.91	11.01	11.11	11.21	11.31	11.41	11.51	11.61
106.5	9.19	9.29	9.39	9.49	9.59	9.69	9.78	9.88	9.98	10.08	10.18	10.28	10.38	10.48	10.58	10.68	10.78	10.88	10.98	11.08	11.18	11.28	11.38
105.0	8.96	9.06	9.16	9.26	9.36	9.46	9.56	9.65	9.76	9.86	9.96	10.06	10.16	10.26	10.36	10.46	10.56	10.66	10.76	10.86	10.96	11.06	11.16
103.5	8.74	8.84	8.94	9.03	9.13	9.23	9.33	9.43	9.53	9.63	9.73	9.83	9.93	10.03	10.13	10.23	10.33	10.43	10.53	10.63	10.73	10.83	10.93
102.0	8.51	8.61	8.71	8.81	8.91	9.01	9.11	9.21	9.31	9.41	9.51	9.61	9.71	9.81	9.91	10.01	10.11	10.21	10.31	10.41	10.51	10.61	10.71
100.5	8.28	8.38	8.48	8.58	8.68	8.78	8.88	8.98	9.08	9.18	9.28	9.38	9.48	9.58	9.68	9.78	9.88	9.98	10.08	10.18	10.28	10.38	10.48
99.0	8.06	8.16	8.26	8.36	8.46	8.56	8.66	8.76	8.86	8.96	9.06	9.16	9.26	9.36	9.46	9.56	9.66	9.76	9.86	9.96	10.06	10.16	10.26
97.5	7.83	7.93	8.03	8.13	8.23	8.33	8.43	8.53	8.63	8.73	8.83	8.93	9.03	9.13	9.23	9.33	9.43	9.53	9.63	9.73	9.83	9.93	10.03
96.0	7.61	7.71	7.81	7.91	8.01	8.11	8.21	8.31	8.41	8.51	8.61	8.71	8.81	8.91	9.01	9.11	9.21	9.31	9.41	9.51	9.60	9.70	9.80

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.03	.07
.1	.02	.05	.08
.2	.03	.06	.10
.3	.05	.08	.11
.4	.06	.09	.13
.5	.08	.11	.14
.6	.09	.12	.16
.7	.11	.14	.17
.8	.12	.15	.19
.9	.14	.17	.20
1.0	.15	.18	.22
1.1	.17	.20	.23
1.2	.18	.21	.25
1.3	.20	.23	.26
1.4	.21	.24	.28

Table 55

Predicting Weight (Kilograms) of Girls, Age Five Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circum-ference, Centi-meters	Knee Width, Centimeters																									
	5.9	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.5
63.6	12.20	12.32	12.44	12.55	12.67	12.79	12.90	13.02	13.14	13.25	13.37	13.49	13.60	13.72	13.84	13.95	14.07	14.19	14.30	14.42	14.54	14.65	14.77	14.89	15.00	15.12
63.0	11.91	12.04	12.15	12.27	12.39	12.50	12.62	12.74	12.85	12.97	13.09	13.20	13.32	13.44	13.55	13.67	13.79	13.90	14.02	14.14	14.25	14.37	14.49	14.60	14.72	14.84
62.4	11.64	11.75	11.87	11.99	12.10	12.22	12.34	12.45	12.57	12.69	12.80	12.92	13.04	13.15	13.27	13.39	13.50	13.62	13.74	13.85	13.97	14.09	14.20	14.32	14.44	14.55
61.8	11.35	11.47	11.59	11.70	11.82	11.94	12.05	12.17	12.29	12.40	12.52	12.64	12.75	12.87	12.99	13.10	13.22	13.34	13.45	13.57	13.69	13.80	13.92	14.04	14.15	14.27
61.2	11.07	11.18	11.30	11.42	11.54	11.65	11.77	11.89	12.00	12.12	12.24	12.35	12.47	12.59	12.70	12.82	12.94	13.05	13.17	13.29	13.40	13.52	13.64	13.75	13.87	13.99
60.6	10.78	10.90	11.02	11.13	11.25	11.37	11.48	11.60	11.72	11.83	11.95	12.07	12.19	12.30	12.42	12.54	12.65	12.77	12.89	13.00	12.12	13.24	13.35	13.47	13.59	13.70
60.0	10.50	10.62	10.73	10.85	10.97	11.08	11.20	11.32	11.43	11.55	11.67	11.78	11.90	12.02	12.13	12.25	12.37	12.48	12.60	12.72	12.84	12.95	13.07	13.19	13.30	13.42
59.4	10.22	10.33	10.45	10.57	10.68	10.80	10.92	11.03	11.15	11.27	11.38	11.50	11.62	11.73	11.85	11.97	12.08	12.20	12.32	12.43	12.55	12.67	12.79	12.90	13.02	13.13
58.8	9.93	10.05	10.17	10.28	10.40	10.52	10.63	10.75	10.87	10.98	11.10	11.22	11.33	11.45	11.57	11.68	11.80	11.92	12.03	12.15	12.27	12.38	12.50	12.62	12.73	12.85
58.2	9.65	9.77	9.88	10.00	10.12	10.23	10.35	10.47	10.58	10.70	10.82	10.93	11.05	11.17	11.29	11.40	11.52	11.63	11.75	11.87	11.98	12.10	12.22	12.33	12.45	12.57
57.6	9.37	9.48	9.60	9.72	9.83	9.95	10.07	10.18	10.30	10.42	10.53	10.65	10.77	10.88	11.00	11.12	11.23	11.35	11.47	11.58	11.70	11.82	11.93	12.05	12.17	12.29
57.0	9.08	9.20	9.31	9.43	9.55	9.67	9.78	9.90	10.02	10.13	10.25	10.37	10.48	10.60	10.72	10.83	10.95	11.07	11.18	11.30	11.42	11.53	11.65	11.77	11.88	12.00
56.4	8.80	8.91	9.03	9.15	9.26	9.38	9.50	9.61	9.73	9.85	9.97	10.08	10.20	10.32	10.43	10.55	10.67	10.78	10.95	11.02	11.13	11.25	11.37	11.48	11.60	11.72
55.8	8.51	8.63	8.75	8.86	8.98	9.10	9.21	9.33	9.45	9.56	9.68	9.80	9.91	10.03	10.15	10.26	10.38	10.50	10.62	10.73	10.85	10.97	11.08	11.20	11.32	11.43
55.2	8.23	8.35	8.46	8.58	8.70	8.81	8.93	9.05	9.16	9.28	9.40	9.51	9.63	9.75	9.86	9.98	10.10	10.21	10.33	10.45	10.56	10.68	10.80	10.91	11.03	11.15
54.6	7.95	8.06	8.18	8.30	8.41	8.53	8.65	8.76	8.88	9.00	9.11	9.23	9.35	9.46	9.58	9.70	9.81	9.93	10.05	10.16	10.28	10.40	10.51	10.63	10.75	10.86
54.0	7.66	7.78	7.90	8.01	8.13	8.25	8.36	8.48	8.60	8.71	8.83	8.95	9.06	9.18	9.30	9.41	9.53	9.65	9.76	9.88	10.00	10.11	10.23	10.35	10.46	10.58
53.4	7.38	7.50	7.61	7.73	7.85	7.96	8.08	8.20	8.31	8.43	8.55	8.66	8.78	8.90	9.01	9.13	9.25	9.36	9.48	9.60	9.71	9.83	9.95	10.06	10.18	10.30
52.8	7.09	7.21	7.33	7.45	7.56	7.68	7.80	7.91	8.03	8.15	8.26	8.38	8.50	8.61	8.73	8.85	8.96	9.08	9.20	9.31	9.43	9.55	9.66	9.78	9.90	10.01
52.2	6.81	6.93	7.04	7.16	7.28	7.39	7.51	7.63	7.74	7.86	7.98	8.10	8.21	8.33	8.45	8.56	8.68	8.80	8.91	9.03	9.15	9.26	9.38	9.50	9.61	9.73
51.6	6.53	6.64	6.76	6.88	6.99	7.11	7.23	7.34	7.46	7.58	7.69	7.81	7.93	8.04	8.16	8.28	8.40	8.51	8.63	8.75	8.86	8.98	9.10	9.21	9.33	9.45
51.0	6.24	6.36	6.48	6.59	6.71	6.83	6.94	7.06	7.18	7.29	7.41	7.53	7.64	7.76	7.88	7.99	8.11	8.23	8.34	8.46	8.58	8.69	8.81	8.93	9.05	9.16
50.4	5.96	6.08	6.19	6.31	6.43	6.54	6.66	6.78	6.89	7.01	7.13	7.24	7.36	7.48	7.59	7.71	7.83	7.94	8.06	8.18	8.29	8.41	8.53	8.64	8.76	8.88
49.8	5.68	5.79	5.91	6.03	6.14	6.26	6.38	6.49	6.61	6.73	6.84	6.96	7.08	7.19	7.31	7.43	7.54	7.66	7.78	7.89	8.01	8.13	8.24	8.36	8.48	8.59
49.2	5.39	5.51	5.63	5.74	5.86	5.98	6.09	6.21	6.33	6.44	6.56	6.68	6.79	6.91	7.03	7.14	7.26	7.38	7.49	7.61	7.73	7.84	7.96	8.08	8.19	8.31
48.6	5.11	5.23	5.34	5.46	5.58	5.69	5.81	5.93	6.04	6.16	6.28	6.39	6.51	6.63	6.74	6.86	6.98	7.09	7.21	7.33	7.44	7.56	7.68	7.79	7.91	8.03
48.0	4.82	4.94	5.06	5.17	5.29	5.41	5.52	5.64	5.76	5.88	5.99	6.11	6.23	6.34	6.46	6.58	6.69	6.81	6.93	7.04	7.16	7.28	7.39	7.51	7.63	7.74
47.4	4.54	4.66	4.77	4.89	5.01	5.12	5.24	5.36	5.47	5.59	5.71	5.82	5.94	6.06	6.17	6.29	6.41	6.53	6.64	6.76	6.88	6.99	7.11	7.23	7.34	7.46
46.8	4.25	4.37	4.49	4.61	4.72	4.84	4.96	5.07	5.19	5.31	5.42	5.54	5.66	5.77	5.89	6.01	6.12	6.24	6.36	6.47	6.59	6.70	6.82	6.94	7.06	7.18

Interpolation Table

Chest Circum-ference	Knee 0
0	.00
.1	.05
.2	.09
.3	.14

Table 58

Predicting Weight (Kilograms) of Girls, Age Six Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																							
	15.6	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5
134	18.22	18.30	18.38	18.45	18.53	18.61	18.69	18.77	18.85	18.93	19.01	19.09	19.17	19.24	19.32	19.40	19.48	19.56	19.64	19.72	19.80	19.88	19.96	20.03
133	18.11	18.19	18.27	18.35	18.43	18.51	18.59	18.67	18.74	18.82	18.90	18.98	19.06	19.14	19.22	19.30	19.38	19.46	19.53	19.61	19.69	19.77	19.85	19.93
132	18.01	18.09	18.17	18.24	18.32	18.40	18.42	18.56	18.64	18.72	18.80	18.88	18.95	19.03	19.11	19.19	19.27	19.35	19.43	19.51	19.59	19.67	19.74	19.82
131	17.90	17.98	18.06	18.14	18.22	18.30	18.38	18.45	18.53	18.61	18.69	18.77	18.85	18.93	19.01	19.09	19.17	19.24	19.32	19.40	19.48	19.56	19.64	19.72
130	17.80	17.88	17.95	18.03	18.11	18.19	18.27	18.35	18.43	18.51	18.59	18.67	18.74	18.82	18.90	18.98	19.06	19.14	19.22	19.30	19.38	19.46	19.53	19.61
129	17.69	17.77	17.85	17.93	18.01	18.09	18.17	18.24	18.32	18.40	18.48	18.56	18.64	18.72	18.80	18.88	18.96	19.03	19.11	19.19	19.27	19.35	19.43	19.51
128	17.59	17.66	17.74	17.82	17.90	17.98	18.06	18.14	18.22	18.30	18.38	18.45	18.53	18.61	18.69	18.77	18.85	18.93	19.01	19.09	19.17	19.24	19.32	19.40
127	17.48	17.56	17.64	17.72	17.80	17.88	17.95	18.03	18.11	18.19	18.27	18.35	18.43	18.51	18.59	18.67	18.74	18.82	18.90	18.98	19.06	19.14	19.22	19.30
126	17.38	17.45	17.53	17.61	17.69	17.77	17.85	17.93	18.01	18.09	18.17	18.24	18.32	18.40	18.48	18.56	18.64	18.72	18.80	18.88	18.96	19.03	19.11	19.19
125	17.27	17.35	17.43	17.51	17.59	17.66	17.74	17.82	17.90	17.98	18.06	18.14	18.22	18.30	18.38	18.45	18.53	18.61	18.69	18.77	18.85	18.93	19.01	19.09
124	17.16	17.24	17.32	17.40	17.48	17.56	17.64	17.72	17.80	17.88	17.95	18.03	18.11	18.19	18.27	18.35	18.43	18.51	18.59	18.67	18.74	18.82	18.90	18.98
123	17.06	17.14	17.22	17.30	17.38	17.45	17.53	17.61	17.69	17.77	17.85	17.93	18.01	18.09	18.17	18.24	18.32	18.40	18.48	18.56	18.64	18.72	18.80	18.88
122	16.95	17.03	17.11	17.19	17.27	17.35	17.43	17.51	17.59	17.66	17.74	17.82	17.90	17.98	18.06	18.14	18.22	18.30	18.38	18.45	18.53	18.61	18.69	18.77
121	16.85	16.93	17.01	17.09	17.16	17.24	17.32	17.40	17.48	17.56	17.64	17.72	17.80	17.88	17.95	18.03	18.11	18.19	18.27	18.35	18.43	18.51	18.59	18.67
120	16.74	16.82	16.90	16.98	17.06	17.14	17.22	17.30	17.38	17.45	17.53	17.61	17.69	17.77	17.85	17.93	18.01	18.09	18.17	18.24	18.32	18.40	18.48	18.56
119	16.64	16.72	16.80	16.88	16.95	17.03	17.11	17.19	17.27	17.35	17.43	17.51	17.59	17.67	17.74	17.82	17.90	17.98	18.06	18.14	18.22	18.30	18.38	18.45
118	16.53	16.61	16.69	16.77	16.85	16.93	17.01	17.09	17.16	17.24	17.32	17.40	17.48	17.56	17.64	17.72	17.80	17.88	17.95	18.03	18.11	18.19	18.27	18.35
117	16.43	16.51	16.59	16.66	16.74	16.82	16.90	16.98	17.06	17.14	17.22	17.30	17.38	17.45	17.53	17.61	17.69	17.77	17.85	17.93	18.01	18.09	18.17	18.24
116	16.32	16.40	16.48	16.56	16.64	16.72	16.80	16.88	16.95	17.03	17.11	17.19	17.27	17.35	17.43	17.51	17.59	17.67	17.74	17.82	17.90	17.98	18.06	18.14
115	16.22	16.30	16.37	16.45	16.53	16.61	16.69	16.77	16.85	16.93	17.01	17.09	17.16	17.24	17.32	17.40	17.48	17.56	17.64	17.72	17.80	17.88	17.95	18.03
114	16.11	16.19	16.27	16.35	16.43	16.51	16.59	16.66	16.74	16.82	16.90	16.98	17.06	17.14	17.22	17.30	17.38	17.45	17.53	17.61	17.69	17.77	17.85	17.93
113	16.01	16.09	16.16	16.24	16.32	16.40	16.48	16.56	16.64	16.72	16.80	16.88	16.95	17.03	17.11	17.19	17.27	17.35	17.43	17.51	17.59	17.67	17.74	17.82
112	15.90	15.98	16.06	16.14	16.22	16.30	16.38	16.45	16.53	16.61	16.69	16.77	16.85	16.93	17.01	17.09	17.16	17.24	17.32	17.40	17.48	17.56	17.64	17.72
111	15.80	15.87	15.95	16.03	16.11	16.19	16.27	16.35	16.43	16.51	16.59	16.66	16.74	16.82	16.90	16.98	17.06	17.14	17.22	17.30	17.38	17.45	17.53	17.61
110	15.69	15.77	15.85	15.93	16.01	16.09	16.16	16.24	16.32	16.40	16.48	16.56	16.64	16.72	16.80	16.88	16.95	17.03	17.11	17.19	17.27	17.35	17.43	17.51
109	15.59	15.66	15.74	15.82	15.90	15.98	16.06	16.14	16.22	16.30	16.38	16.45	16.53	16.61	16.69	16.77	16.85	16.93	17.01	17.09	17.16	17.24	17.32	17.40
108	15.48	15.56	15.64	15.72	15.80	15.87	15.95	16.03	16.11	16.19	16.27	16.35	16.43	16.51	16.59	16.66	16.74	16.82	16.90	16.98	17.06	17.14	17.22	17.30
107	15.37	15.45	15.53	15.61	15.69	15.77	15.85	15.93	16.01	16.09	16.16	16.24	16.32	16.40	16.48	16.56	16.64	16.72	16.80	16.88	16.95	17.03	17.11	17.19
106	15.27	15.35	15.43	15.51	15.59	15.66	15.74	15.82	15.90	15.98	16.06	16.14	16.22	16.30	16.38	16.45	16.53	16.61	16.69	16.77	16.85	16.93	17.01	17.09
105	15.16	15.24	15.32	15.40	15.48	15.56	15.64	15.72	15.80	15.87	15.95	16.03	16.11	16.19	16.27	16.35	16.43	16.51	16.59	16.66	16.74	16.82	16.90	16.98
104	15.06	15.14	15.22	15.30	15.37	15.45	15.53	15.61	15.69	15.77	15.85	15.93	16.01	16.09	16.16	16.24	16.32	16.40	16.48	16.56	16.64	16.72	16.80	16.88
103	14.95	15.03	15.11	15.19	15.27	15.35	15.42	15.50	15.59	15.66	15.74	15.82	15.90	15.98	16.06	16.14	16.22	16.30	16.38	16.45	16.53	16.61	16.69	16.77

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.03	.05
.1	.01	.04	.06
.2	.02	.05	.07
.3	.03	.06	.08
.4	.04	.07	.09
.5	.05	.08	.11
.6	.06	.09	.12
.7	.07	.10	.13
.8	.08	.11	.14
.9	.09	.12	.15

Table 57

Predicting Weight (Kilograms) of Girls, Age Six Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1053 height + .2633 hips + .5137 chest circumference + 1.6253 knee - 35.3942; R = .6972)

Chest Circumference, Centimeters	Knee Width, Centimeters																										
	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5
64.0	7.07	7.23	7.40	7.56	7.72	7.88	8.05	8.21	8.37	8.53	8.70	8.86	9.02	9.18	9.35	9.51	9.67	9.83	10.00	10.16	10.32	10.49	10.65	10.81	10.97	11.14	11.30
63.5	6.82	6.98	7.14	7.30	7.47	7.63	7.79	7.95	8.12	8.28	8.44	8.60	8.77	8.93	9.09	9.25	9.42	9.58	9.74	9.90	10.07	10.23	10.39	10.55	10.72	10.88	11.04
63.0	6.56	6.72	6.88	7.05	7.21	7.37	7.53	7.70	7.86	8.02	8.18	8.35	8.51	8.67	8.83	9.00	9.16	9.32	9.48	9.65	9.81	9.97	10.13	10.30	10.46	10.62	10.78
62.5	6.30	6.46	6.63	6.79	6.95	7.11	7.28	7.44	7.60	7.76	7.93	8.09	8.25	8.41	8.58	8.74	8.90	9.06	9.23	9.40	9.55	9.71	9.90	9.04	9.20	9.36	10.53
62.0	6.04	6.21	6.37	6.53	6.69	6.86	7.02	7.18	7.34	7.51	7.67	7.83	7.99	8.16	8.32	8.48	8.64	8.81	8.97	9.13	9.30	9.46	9.62	9.78	9.95	10.11	10.27
61.5	5.79	5.95	6.11	6.28	6.44	6.60	6.76	6.93	7.09	7.25	7.41	7.58	7.74	7.90	8.06	8.23	8.39	8.55	8.71	8.88	9.04	9.20	9.36	9.53	9.69	9.85	10.01
61.0	5.53	5.69	5.85	6.02	6.18	6.34	6.51	6.67	6.83	6.99	7.16	7.32	7.48	7.64	7.81	7.97	8.13	8.29	8.46	8.62	8.78	8.94	9.11	9.27	9.43	9.59	9.76
60.5	5.27	5.44	5.60	5.76	5.92	6.09	6.25	6.41	6.57	6.74	6.90	7.06	7.22	7.39	7.55	7.71	7.87	8.04	8.20	8.36	8.52	8.69	8.85	9.01	9.17	9.34	9.50
60.0	5.02	5.18	5.34	5.50	5.67	5.83	5.99	6.15	6.32	6.48	6.64	6.80	6.97	7.13	7.29	7.46	7.62	7.78	7.94	8.11	8.27	8.43	8.59	8.76	8.92	9.08	9.24
59.5	4.76	4.92	5.09	5.25	5.41	5.57	5.74	5.90	6.06	6.22	6.39	6.55	6.71	6.87	7.04	7.20	7.36	7.52	7.69	7.85	8.01	8.17	8.34	8.50	8.66	8.82	8.99
59.0	4.50	4.67	4.83	4.99	5.15	5.32	5.48	5.64	5.80	5.97	6.13	6.29	6.45	6.62	6.78	6.94	7.10	7.27	7.43	7.59	7.75	7.92	8.08	8.24	8.40	8.57	8.73
58.5	4.25	4.41	4.57	4.73	4.90	5.06	5.22	5.38	5.55	5.71	5.87	6.03	6.20	6.36	6.52	6.68	6.85	7.01	7.17	7.33	7.50	7.66	7.82	7.98	8.15	8.31	8.47
58.0	3.99	4.15	4.31	4.48	4.64	4.80	4.96	5.13	5.29	5.45	5.61	5.78	5.94	6.10	6.27	6.43	6.59	6.75	6.92	7.08	7.24	7.40	7.57	7.73	7.89	8.05	8.22
57.5	3.73	3.90	4.06	4.22	4.38	4.55	4.71	4.87	5.03	5.20	5.36	5.52	5.68	5.85	6.01	6.17	6.33	6.50	6.66	6.82	6.98	7.15	7.31	7.47	7.63	7.80	7.96
57.0	3.48	3.64	3.80	3.96	4.13	4.29	4.45	4.61	4.78	4.94	5.10	5.26	5.43	5.59	5.75	5.91	6.08	6.24	6.40	6.56	6.73	6.89	7.05	7.21	7.38	7.54	7.70
56.5	3.22	3.38	3.54	3.71	3.87	4.03	4.19	4.36	4.52	4.68	4.84	5.01	5.17	5.33	5.49	5.66	5.82	5.98	6.14	6.31	6.47	6.63	6.79	6.96	7.12	7.28	7.44
56.0	2.96	3.12	3.29	3.45	3.61	3.77	3.94	4.10	4.26	4.43	4.59	4.75	4.91	5.08	5.24	5.40	5.56	5.73	5.89	6.05	6.21	6.38	6.54	6.70	6.86	7.03	7.19
55.5	2.71	2.87	3.03	3.19	3.36	3.52	3.68	3.84	4.01	4.17	4.33	4.49	4.66	4.82	4.98	5.14	5.31	5.47	5.63	5.79	5.96	6.12	6.28	6.44	6.61	6.77	6.93
55.0	2.45	2.61	2.77	2.94	3.10	3.26	3.42	3.59	3.75	3.91	4.07	4.24	4.40	4.56	4.72	4.89	5.05	5.21	5.37	5.54	5.70	5.86	6.02	6.19	6.35	6.51	6.67
54.5	2.19	2.35	2.52	2.68	2.84	3.00	3.17	3.33	3.49	3.65	3.82	3.98	4.14	4.30	4.47	4.63	4.79	4.95	5.12	5.28	5.44	5.60	5.77	5.93	6.09	6.25	6.42
54.0	1.93	2.10	2.26	2.42	2.58	2.75	2.91	3.07	3.24	3.40	3.56	3.72	3.88	4.05	4.21	4.37	4.54	4.70	4.86	5.02	5.19	5.35	5.51	5.67	5.84	6.00	6.16
53.5	1.68	1.84	2.00	2.17	2.33	2.49	2.65	2.82	2.98	3.14	3.30	3.47	3.63	3.79	3.95	4.12	4.28	4.44	4.60	4.77	4.93	5.09	5.25	5.42	5.58	5.74	5.90
53.0	1.42	1.58	1.75	1.91	2.07	2.23	2.40	2.56	2.72	2.88	3.05	3.21	3.37	3.53	3.70	3.86	4.02	4.18	4.35	4.51	4.67	4.83	5.00	5.16	5.32	5.48	5.65
52.5	1.16	1.33	1.49	1.65	1.81	1.98	2.14	2.30	2.46	2.63	2.79	2.95	3.11	3.28	3.44	3.60	3.76	3.93	4.09	4.25	4.41	4.58	4.74	4.90	5.07	5.23	5.39
52.0	0.91	1.07	1.23	1.40	1.56	1.72	1.88	2.04	2.21	2.37	2.53	2.70	2.86	3.02	3.18	3.35	3.51	3.67	3.83	4.00	4.16	4.32	4.48	4.65	4.81	4.97	5.13
51.5	0.65	0.81	0.98	1.14	1.30	1.46	1.63	1.79	1.95	2.11	2.28	2.44	2.60	2.76	2.93	3.09	3.25	3.41	3.58	3.74	3.90	4.06	4.23	4.39	4.55	4.71	4.88
51.0	0.39	0.56	0.72	0.88	1.04	1.21	1.37	1.53	1.69	1.86	2.02	2.18	2.34	2.51	2.67	2.83	2.99	3.16	3.32	3.48	3.64	3.81	3.97	4.13	4.29	4.46	4.62
50.5	0.14	0.30	0.46	0.62	0.79	0.95	1.11	1.27	1.44	1.60	1.76	1.92	2.09	2.25	2.41	2.57	2.74	2.90	3.06	3.22	3.39	3.55	3.71	3.88	4.04	4.20	4.36
50.0	-0.12	0.04	0.21	0.37	0.53	0.69	0.86	1.02	1.18	1.34	1.51	1.67	1.83	1.99	2.16	2.32	2.48	2.64	2.81	2.97	3.13	3.29	3.46	3.62	3.78	3.94	4.11
49.5	-0.38	-0.21	-0.05	0.11	0.27	0.44	0.60	0.76	0.92	1.09	1.25	1.41	1.57	1.74	1.90	2.06	2.22	2.39	2.55	2.71	2.87	3.04	3.20	3.36	3.52	3.69	3.85
49.0	-0.63	-0.47	-0.31	-0.15	0.02	0.18	0.34	0.50	0.67	0.83	0.99	1.15	1.32	1.48	1.64	1.80	1.97	2.13	2.29	2.45	2.62	2.78	2.94	3.10	3.27	3.43	3.59

Interpolation Table

Chest Circumference	Knee
	0
0	0
.1	.051
.2	.103
.3	.154
.4	.205

Table 58

Predicting Weight (Kilograms) of Girls, Age Seven Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centi-meters	Hip Width, Centimeters																				
	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0
137	11.90	12.09	12.27	12.46	12.65	12.84	13.02	13.21	13.40	13.59	13.77	13.96	14.15	14.34	14.52	14.71	14.90	15.09	15.27	15.46	15.65
136	11.70	11.90	12.08	12.26	12.45	12.64	12.83	13.01	13.20	13.39	13.58	13.76	13.95	14.14	14.33	14.51	14.70	14.89	15.08	15.26	15.45
135	11.51	11.70	11.88	12.06	12.26	12.45	12.63	12.82	13.01	13.20	13.38	13.57	13.76	13.95	14.13	14.32	14.51	14.70	14.88	15.07	15.26
134	11.31	11.51	11.69	11.87	12.06	12.25	12.44	12.62	12.81	13.00	13.19	13.37	13.56	13.75	13.94	14.12	14.31	14.50	14.69	14.87	15.06
133	11.12	11.31	11.49	11.68	11.87	12.06	12.24	12.43	12.62	12.81	12.99	13.18	13.37	13.56	13.74	13.92	14.12	14.31	14.49	14.68	14.87
132	10.92	11.12	11.30	11.49	11.67	11.87	12.05	12.24	12.42	12.62	12.80	12.99	13.17	13.37	13.55	13.74	13.92	14.12	14.30	14.49	14.67
131	10.73	10.92	11.10	11.29	11.48	11.67	11.85	12.04	12.23	12.42	12.60	12.79	12.98	13.17	13.35	13.54	13.73	13.92	14.10	14.29	14.48
130	10.54	10.73	10.91	11.10	11.29	11.48	11.66	11.85	12.04	12.23	12.41	12.60	12.79	12.98	13.16	13.35	13.54	13.72	13.91	14.10	14.29
129	10.34	10.53	10.72	10.90	11.09	11.28	11.47	11.65	11.84	12.03	12.22	12.40	12.59	12.78	12.97	13.15	13.34	13.53	13.72	13.90	14.09
128	10.15	10.34	10.52	10.71	10.90	11.09	11.27	11.46	11.65	11.84	12.02	12.21	12.40	12.59	12.77	12.96	13.15	13.34	13.52	13.71	13.90
127	9.95	10.15	10.33	10.51	10.70	10.89	11.08	11.26	11.45	11.64	11.83	12.01	12.20	12.39	12.58	12.76	12.95	13.14	13.33	13.51	13.70
126	9.76	9.95	10.13	10.32	10.51	10.70	10.88	11.07	11.26	11.45	11.63	11.82	12.01	12.20	12.38	12.57	12.76	12.95	13.13	13.32	13.51
125	9.56	9.76	9.94	10.12	10.31	10.50	10.69	10.87	11.06	11.25	11.44	11.62	11.81	12.00	12.19	12.37	12.56	12.75	12.94	13.12	13.31
124	9.37	9.56	9.74	9.93	10.12	10.31	10.49	10.68	10.87	11.06	11.24	11.43	11.62	11.81	11.99	12.18	12.37	12.56	12.74	12.93	13.12
123	9.17	9.37	9.55	9.73	9.92	10.11	10.30	10.48	10.67	10.86	11.05	11.23	11.42	11.61	11.80	11.98	12.17	12.36	12.55	12.73	12.92
122	8.98	9.17	9.35	9.54	9.73	9.92	10.10	10.29	10.48	10.67	10.85	11.04	11.23	11.42	11.60	11.79	11.98	12.17	12.35	12.54	12.73
121	8.78	8.98	9.16	9.35	9.53	9.72	9.91	10.10	10.28	10.48	10.66	10.85	11.03	11.23	11.41	11.60	11.78	11.97	12.16	12.35	12.53
120	8.59	8.78	8.97	9.15	9.34	9.53	9.72	9.90	10.09	10.28	10.47	10.65	10.84	11.03	11.22	11.40	11.59	11.78	11.97	12.15	12.34
119	8.40	8.60	8.77	8.96	9.15	9.34	9.52	9.71	9.90	10.09	10.27	10.46	10.65	10.84	11.02	11.21	11.40	11.59	11.77	11.96	12.15
118	8.20	8.39	8.58	8.76	8.95	9.14	9.33	9.51	9.70	9.89	10.08	10.26	10.45	10.64	10.83	11.01	11.20	11.39	11.58	11.76	11.95
117	8.01	8.20	8.38	8.57	8.76	8.95	9.13	9.32	9.51	9.70	9.88	10.07	10.26	10.45	10.63	10.82	11.01	11.20	11.38	11.57	11.76
116	7.81	8.01	8.19	8.37	8.56	8.75	8.94	9.12	9.31	9.50	9.69	9.87	10.06	10.25	10.44	10.63	10.81	11.00	11.19	11.37	11.56
115	7.62	7.81	7.99	8.18	8.37	8.56	8.74	8.93	9.12	9.31	9.49	9.68	9.87	10.06	10.24	10.43	10.62	10.81	10.99	11.18	11.37
114	7.42	7.62	7.80	7.98	8.17	8.36	8.55	8.73	8.92	9.11	9.30	9.48	9.67	9.86	10.05	10.24	10.42	10.61	10.80	10.98	11.17
113	7.23	7.42	7.60	7.79	7.98	8.17	8.35	8.54	8.73	8.92	9.10	9.29	9.48	9.67	9.85	10.04	10.23	10.42	10.60	10.79	10.98
112	7.03	7.23	7.41	7.60	7.78	7.97	8.16	8.35	8.53	8.73	8.91	9.10	9.28	9.48	9.66	9.84	10.03	10.23	10.41	10.60	10.78

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.04	.08	.11	.15
.1	.02	.06	.09	.13	.17
.2	.04	.08	.11	.15	.19
.3	.06	.10	.13	.17	.21
.4	.08	.12	.15	.19	.23
.5	.10	.14	.17	.21	.25
.6	.12	.15	.19	.23	.27
.7	.14	.17	.21	.25	.29
.8	.16	.19	.23	.27	.31
.9	.18	.21	.25	.29	.33

Table 59

Predicting Weight (Kilograms) of Girls, Age Seven Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1945 height + .3750 hips + .6070 chest circumference + 1.2585 knee - 50.9433; R = .9340)

Chest Circumference, Centimeters	Knee Width, Centimeters																									
	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7
66.4	17.16	17.29	17.42	17.54	17.67	17.79	17.92	18.05	18.17	18.30	18.42	18.55	18.67	18.80	18.93	19.05	19.18	19.30	19.43	19.56	19.68	19.81	19.93	20.06	20.18	20.31
65.6	16.68	16.80	16.93	17.06	17.18	17.31	17.43	17.56	17.69	17.81	17.94	18.06	18.19	18.31	18.44	18.57	18.69	18.82	18.94	19.07	19.20	19.32	19.45	19.57	19.70	19.82
64.8	16.19	16.32	16.44	16.57	16.70	16.82	16.95	17.07	17.20	17.33	17.45	17.58	17.70	17.83	17.95	18.08	18.21	18.33	18.46	18.58	18.71	18.84	18.96	19.09	19.21	19.34
64.0	15.71	15.83	15.96	16.08	16.21	16.34	16.46	16.59	16.71	16.84	16.97	17.09	17.22	17.34	17.47	17.60	17.72	17.85	17.97	18.10	18.22	18.35	18.48	18.60	18.73	18.85
63.2	15.22	15.35	15.47	15.60	15.73	15.86	15.98	16.10	16.23	16.35	16.48	16.61	16.73	16.86	16.98	17.11	17.24	17.36	17.49	17.61	17.74	17.86	17.99	18.12	18.24	18.37
62.4	14.74	14.86	14.98	15.11	15.24	15.37	15.49	15.62	15.74	15.87	15.99	16.12	16.25	16.37	16.50	16.62	16.75	16.88	17.00	17.13	17.25	17.38	17.50	17.63	17.76	17.88
61.6	14.25	14.38	14.50	14.63	14.75	14.88	15.01	15.13	15.26	15.38	15.51	15.63	15.76	15.89	16.01	16.14	16.26	16.39	16.52	16.64	16.77	16.89	17.02	17.15	17.27	17.40
60.8	13.77	13.89	14.02	14.14	14.27	14.39	14.52	14.65	14.77	14.90	15.02	15.15	15.28	15.40	15.53	15.65	15.78	15.90	16.03	16.16	16.28	16.41	16.53	16.66	16.79	16.91
60.0	13.28	13.41	13.53	13.66	13.78	13.91	14.03	14.16	14.29	14.41	14.54	14.66	14.79	14.92	15.04	15.17	15.29	15.42	15.54	15.67	15.80	15.92	16.05	16.17	16.30	16.43
59.2	12.79	12.92	13.05	13.17	13.30	13.42	13.55	13.67	13.80	13.93	14.05	14.18	14.30	14.43	14.56	14.68	14.81	14.93	15.06	15.18	15.31	15.44	15.56	15.69	15.81	15.94
58.4	12.31	12.43	12.56	12.69	12.81	12.94	13.06	13.19	13.32	13.44	13.57	13.69	13.82	13.94	14.07	14.20	14.32	14.45	14.57	14.70	14.83	14.95	15.08	15.20	15.33	15.45
57.6	11.82	11.95	12.07	12.20	12.33	12.45	12.58	12.70	12.83	12.96	13.08	13.21	13.33	13.46	13.58	13.71	13.84	13.96	14.09	14.21	14.34	14.47	14.59	14.72	14.84	14.97
56.8	11.34	11.46	11.59	11.71	11.84	11.97	12.09	12.22	12.34	12.47	12.60	12.72	12.85	12.97	13.10	13.22	13.35	13.48	13.60	13.73	13.85	13.98	14.11	14.23	14.36	14.48
56.0	10.85	10.98	11.10	11.23	11.35	11.48	11.61	11.73	11.86	11.98	12.11	12.24	12.36	12.49	12.61	12.74	12.87	12.99	13.12	13.24	13.37	13.49	13.62	13.75	13.87	14.00
55.2	10.37	10.49	10.62	10.74	10.87	11.00	11.12	11.25	11.37	11.50	11.62	11.75	11.88	12.00	12.13	12.25	12.38	12.51	12.63	12.76	12.88	13.01	13.13	13.26	13.38	13.51
54.4	9.88	10.00	10.13	10.26	10.38	10.51	10.64	10.76	10.89	11.01	11.14	11.26	11.39	11.52	11.64	11.77	11.89	12.02	12.15	12.27	12.40	12.52	12.65	12.77	12.90	13.03
53.6	9.39	9.52	9.65	9.77	9.90	10.02	10.15	10.28	10.40	10.53	10.65	10.78	10.90	11.03	11.16	11.28	11.41	11.53	11.66	11.79	11.91	12.04	12.16	12.29	12.42	12.54
52.8	8.91	9.03	9.16	9.29	9.41	9.54	9.66	9.79	9.92	10.04	10.17	10.29	10.42	10.55	10.67	10.80	10.92	11.05	11.17	11.30	11.43	11.55	11.68	11.80	11.93	12.06
52.0	8.42	8.55	8.68	8.80	8.93	9.05	9.18	9.30	9.43	9.56	9.68	9.81	9.93	10.06	10.19	10.31	10.44	10.56	10.69	10.81	10.94	11.07	11.19	11.32	11.44	11.57
51.2	7.94	8.06	8.19	8.32	8.44	8.57	8.69	8.82	8.94	9.07	9.20	9.32	9.45	9.57	9.70	9.83	9.95	10.08	10.20	10.33	10.45	10.58	10.71	10.83	10.96	11.08
50.4	7.45	7.58	7.70	7.83	7.96	8.08	8.21	8.33	8.46	8.58	8.71	8.84	8.96	9.09	9.21	9.34	9.47	9.59	9.72	9.84	9.97	10.10	10.22	10.35	10.47	10.60
49.6	6.97	7.09	7.22	7.34	7.47	7.60	7.72	7.85	7.97	8.10	8.23	8.35	8.48	8.60	8.73	8.85	8.98	9.11	9.23	9.36	9.48	9.61	9.73	9.86	9.99	10.11
48.8	6.48	6.61	6.73	6.86	6.98	7.11	7.24	7.36	7.49	7.61	7.74	7.87	7.99	8.12	8.24	8.37	8.49	8.62	8.75	8.87	9.00	9.12	9.25	9.38	9.50	9.63
48.0	6.00	6.12	6.25	6.37	6.50	6.62	6.75	6.88	7.00	7.13	7.26	7.38	7.51	7.63	7.76	7.88	8.01	8.13	8.26	8.39	8.51	8.64	8.76	8.89	9.02	9.14

Interpolation Table

Chest Circumference	Knee
O	O
.1	.061
.2	.121
.3	.182
.4	.243
.5	.304
.6	.364
.7	.425

Table 60

Predicting Weight (Kilograms) of Girls, Age Eight Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																										
	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.1	23.4	23.7	24.0	24.3	24.6	24.9
148.5	21.32	21.37	21.42	21.47	21.52	21.58	21.63	21.68	21.73	21.78	21.83	21.88	21.93	21.98	22.03	22.08	22.13	22.18	22.23	22.28	22.33	22.39	22.44	22.49	22.54	22.59	22.64
147.0	21.05	21.10	21.15	21.20	21.26	21.31	21.36	21.41	21.46	21.51	21.56	21.61	21.66	21.71	21.76	21.86	21.86	21.91	27.96	22.01	22.06	22.12	22.17	22.22	22.27	22.31	22.37
145.5	20.78	20.83	20.88	20.93	20.99	21.04	21.09	21.14	21.19	21.24	21.29	21.34	21.39	21.44	21.49	21.54	21.59	21.64	21.69	21.74	21.80	21.85	21.90	21.95	22.00	22.05	22.10
144.0	20.51	20.56	20.61	20.67	20.72	20.77	20.82	20.87	20.92	20.97	21.02	21.07	21.12	21.17	21.22	21.27	21.32	21.37	21.42	21.47	21.53	21.58	21.63	21.68	21.73	21.78	21.83
142.5	20.24	20.29	20.34	20.40	20.45	20.50	20.55	20.60	20.65	20.70	20.75	20.80	20.85	20.90	20.95	21.00	21.05	21.10	21.15	21.21	21.26	21.31	21.36	21.41	21.46	21.51	21.56
141.0	19.97	20.02	20.08	20.13	20.18	20.23	20.28	20.33	20.38	20.43	20.48	20.53	20.58	20.63	20.68	20.73	20.78	20.83	20.88	20.93	20.99	21.04	21.09	21.14	21.19	21.24	21.29
139.5	19.70	19.75	19.81	19.86	19.91	19.96	20.01	20.06	20.11	20.16	20.21	20.26	20.31	20.36	20.41	20.46	20.51	20.56	20.61	20.66	20.72	20.77	20.82	20.87	20.92	20.97	21.02
138.0	19.43	19.49	19.54	19.59	19.64	19.69	19.74	19.79	19.84	19.89	19.94	19.99	20.04	20.09	20.14	20.19	20.24	20.29	20.34	20.40	20.45	20.50	20.55	20.60	20.65	20.70	20.75
136.5	19.16	19.22	19.27	19.32	19.37	19.42	19.47	19.52	19.57	19.62	19.67	19.72	19.77	19.82	19.87	19.92	19.97	20.02	20.07	20.13	20.18	20.23	20.28	20.33	20.38	20.43	20.48
135.0	18.90	18.95	19.00	19.05	19.10	19.15	19.20	19.25	19.30	19.35	19.40	19.45	19.50	19.55	19.60	19.65	19.70	19.75	19.80	19.86	19.91	19.96	20.01	20.06	20.11	20.16	20.21
133.5	18.63	18.68	18.73	18.78	18.83	18.88	18.93	18.93	19.03	19.08	19.13	19.18	19.23	19.28	19.33	19.38	19.43	19.48	19.54	19.59	19.64	19.69	19.74	19.79	19.84	19.89	19.94
132.0	18.36	18.41	18.46	18.51	18.56	18.61	18.66	18.71	18.76	18.81	18.86	18.91	18.96	19.01	19.06	19.11	19.16	19.22	19.27	19.32	19.37	19.42	19.47	19.52	19.57	19.62	19.67
130.5	18.09	18.14	18.19	18.24	18.29	18.34	18.39	18.44	18.49	18.54	18.59	18.64	18.69	18.74	18.79	18.84	18.89	18.95	19.00	19.05	19.10	19.15	19.20	19.25	19.30	19.35	19.40
129.0	17.82	17.87	17.92	17.97	18.02	18.07	18.12	18.17	18.22	18.27	18.32	18.37	18.42	18.47	18.52	18.57	18.62	18.68	18.73	18.78	18.83	18.88	18.93	18.98	19.03	19.08	19.13
127.5	17.55	17.60	17.65	17.70	17.75	17.80	17.85	17.90	17.95	18.00	18.05	18.10	18.15	18.20	18.25	18.30	18.36	18.41	18.43	18.51	18.56	18.61	18.66	18.71	18.76	18.81	18.86
126.0	17.29	17.33	17.38	17.43	17.48	17.53	17.53	17.63	17.69	17.73	17.78	17.83	17.88	17.93	17.98	18.04	18.09	18.14	18.19	18.24	18.29	18.34	18.39	18.44	18.49	18.54	18.59
124.5	17.01	17.06	17.11	17.16	17.21	17.26	17.31	17.36	17.41	17.46	17.51	17.56	17.61	17.66	17.71	17.77	17.82	17.87	17.92	17.97	18.02	18.07	18.12	18.17	18.22	18.27	18.32
123.0	16.74	16.79	16.84	16.89	16.94	16.99	17.04	17.09	17.14	17.19	17.24	17.29	17.34	17.39	17.45	17.50	17.55	17.60	17.65	17.70	17.75	17.80	17.85	17.90	17.95	18.00	18.05
121.5	16.47	16.52	16.57	16.62	16.67	16.72	16.77	16.82	16.87	16.92	16.97	17.02	17.07	17.12	17.18	17.23	17.29	17.33	17.38	17.43	17.48	17.53	17.58	17.63	17.68	17.73	17.78
120.0	16.20	16.25	16.30	16.35	16.40	16.45	16.50	16.55	16.60	16.65	16.70	16.75	16.80	16.86	16.91	16.96	17.01	17.06	17.11	17.16	17.21	17.26	17.31	17.36	17.41	17.46	17.51
118.5	15.93	15.98	16.03	16.08	16.13	16.18	16.23	16.28	16.33	16.39	16.43	16.48	16.53	16.59	16.64	16.69	16.74	16.79	16.84	16.89	16.94	16.99	17.04	17.09	17.14	17.19	17.24
117.0	15.66	15.71	15.76	15.81	15.86	15.91	15.96	16.01	16.06	16.11	16.15	16.21	16.27	16.32	16.37	16.42	16.47	16.52	16.57	16.62	16.67	16.72	16.77	16.82	16.87	16.92	16.97
115.5	15.40	15.44	15.49	15.54	15.59	15.64	15.69	15.74	15.79	15.84	15.89	15.94	16.00	16.05	16.10	16.15	16.20	16.25	16.30	16.35	16.40	16.45	16.50	16.55	16.60	16.65	16.70
114.0	15.12	15.17	15.22	15.27	15.32	15.37	15.42	15.47	15.52	15.57	15.62	15.68	15.73	15.78	15.83	15.88	15.93	15.98	16.03	16.08	16.13	16.18	16.23	16.28	16.33	16.38	16.44
112.5	14.85	14.90	14.95	15.00	15.05	15.10	15.15	15.20	15.25	15.30	15.35	15.41	15.46	15.51	15.56	15.61	15.66	15.71	15.76	15.81	15.86	15.91	15.96	16.01	16.06	16.11	16.17
111.0	14.58	14.63	14.69	14.73	14.78	14.83	14.88	14.93	14.98	15.03	15.09	15.14	15.19	15.24	15.29	15.34	15.39	15.44	15.49	15.54	15.59	15.64	15.69	15.74	15.79	15.84	15.90

Interpolation Table

Height	Hips		
	0	.1	.2
0	0	.01	.03
.1	.02	.03	.04
.2	.04	.05	.06
.3	.05	.07	.08
.4	.07	.08	.10
.5	.09	.10	.11
.6	.11	.12	.13
.7	.13	.14	.15
.8	.14	.16	.17
.9	.16	.17	.19
1.0	.18	.19	.20
1.1	.20	.21	.22
1.2	.21	.23	.24
1.3	.23	.25	.26
1.4	.25	.26	.28

Table 61

Predicting Weight (Kilograms) of Girls, Age Eight Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1798 height + .1687 hips + .5505 chest circumference + 2.1443 knee - 48.2626; R = .9077)

Chest Circumference, Centimeters	Knee Width, Centimeters																															
	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3
69	11.49	11.70	11.92	12.14	12.35	12.57	12.78	12.99	13.21	13.42	13.64	13.85	14.07	14.28	14.50	14.71	14.92	15.14	15.35	15.57	15.78	16.00	16.21	16.43	16.64	16.85	17.07	17.28	17.50	17.71	17.93
68	10.94	11.16	11.37	11.59	11.80	12.02	12.23	12.44	12.66	12.87	13.09	13.30	13.52	13.73	13.95	14.16	14.37	14.59	14.80	15.02	15.23	15.45	15.66	15.87	16.09	16.30	16.52	16.73	16.95	17.16	17.38
67	10.39	10.61	10.82	11.04	11.25	11.46	11.68	11.89	12.11	12.32	12.54	12.75	12.96	13.18	13.39	13.61	13.82	14.04	14.25	14.47	14.68	14.89	15.11	15.32	15.54	15.75	15.97	16.18	16.40	16.61	16.83
66	9.84	10.05	10.27	10.48	10.70	10.91	11.13	11.34	11.56	11.77	11.99	12.20	12.41	12.63	12.84	13.06	13.27	13.49	13.70	13.92	14.13	14.34	14.56	14.77	14.99	15.20	15.42	15.63	15.85	16.06	16.27
65	9.29	9.51	9.72	9.93	10.15	10.36	10.58	10.79	11.01	11.22	11.43	11.65	11.86	12.08	12.29	12.51	12.72	12.94	13.15	13.36	13.58	13.79	14.01	14.22	14.44	14.65	14.87	15.08	15.29	15.51	15.72
64	8.74	8.96	9.17	9.38	9.60	9.81	10.03	10.24	10.46	10.67	10.88	11.10	11.31	11.53	11.74	11.96	12.17	12.39	12.60	12.81	13.03	13.24	13.46	13.67	13.89	14.10	14.32	14.53	14.74	14.96	15.17
63	8.19	8.41	8.62	8.83	9.05	9.26	9.48	9.69	9.91	10.12	10.33	10.55	10.76	10.98	11.19	11.41	11.62	11.83	12.05	12.26	12.48	12.69	12.91	13.12	13.34	13.55	13.76	13.98	14.19	14.41	14.62
62	7.64	7.85	8.07	8.28	8.50	8.71	8.93	9.14	9.35	9.57	9.78	10.00	10.21	10.43	10.64	10.86	11.07	11.28	11.50	11.71	11.93	12.14	12.36	12.57	12.79	13.00	13.21	13.43	13.64	13.86	14.07
61	7.09	7.30	7.52	7.73	7.95	8.16	8.38	8.59	8.80	9.02	9.23	9.45	9.66	9.88	10.09	10.31	10.52	10.73	10.95	11.16	11.38	11.59	11.81	12.02	12.23	12.45	12.66	12.88	13.09	13.31	13.52
60	6.54	6.75	6.97	7.18	7.40	7.61	7.83	8.04	8.25	8.47	8.68	8.90	9.11	9.33	9.54	9.75	9.97	10.18	10.40	10.61	10.83	11.04	11.26	11.47	11.68	11.90	12.11	12.33	12.54	12.76	12.97
59	5.99	6.20	6.42	6.63	6.85	7.06	7.28	7.49	7.70	7.92	8.13	8.35	8.56	8.78	8.99	9.20	9.42	9.63	9.85	10.06	10.28	10.49	10.71	10.92	11.13	11.35	11.56	11.78	11.99	12.21	12.42
58	5.44	5.65	5.87	6.08	6.30	6.51	6.72	6.94	7.15	7.37	7.58	7.80	8.01	8.22	8.44	8.65	8.87	9.08	9.30	9.51	9.73	9.94	10.15	10.37	10.58	10.80	11.01	11.23	11.44	11.66	11.87
57	4.89	5.10	5.32	5.53	5.75	5.96	6.17	6.39	6.60	6.82	7.03	7.25	7.46	7.67	7.89	8.10	8.32	8.53	8.75	8.96	9.18	9.39	9.60	9.82	10.03	10.25	10.46	10.68	10.89	11.11	11.32
56	4.34	4.55	4.77	4.98	5.19	5.41	5.62	5.84	6.05	6.27	6.48	6.69	6.91	7.12	7.34	7.55	7.77	7.98	8.20	8.41	8.62	8.84	9.05	9.27	9.48	9.70	9.91	10.13	10.34	10.55	10.77
55	3.79	4.00	4.22	4.43	4.64	4.86	5.07	5.29	5.50	5.72	5.93	6.14	6.36	6.57	6.79	7.00	7.22	7.43	7.65	7.86	8.07	8.29	8.50	8.72	8.93	9.15	9.36	9.58	9.79	10.00	10.22
54	3.24	3.45	3.66	3.88	4.09	4.31	4.52	4.74	4.95	5.16	5.38	5.59	5.81	6.02	6.24	6.45	6.67	6.88	7.09	7.31	7.52	7.74	7.95	8.17	8.38	8.60	8.81	9.02	9.24	9.45	9.67
53	2.69	2.90	3.11	3.33	3.54	3.76	3.97	4.19	4.40	4.61	4.83	5.04	5.26	5.47	5.69	5.90	6.12	6.33	6.54	6.76	6.97	7.19	7.40	7.62	7.83	8.05	8.26	8.47	8.69	8.90	9.12
52	2.14	2.35	2.56	2.78	2.99	3.21	3.42	3.64	3.85	4.06	4.28	4.49	4.71	4.92	5.14	5.35	5.56	5.78	5.99	6.21	6.42	6.64	6.85	7.07	7.28	7.49	7.71	7.92	8.14	8.35	8.57
51	1.58	1.80	2.01	2.23	2.44	2.66	2.87	3.09	3.30	3.51	3.73	3.94	4.16	4.37	4.59	4.80	5.01	5.23	5.44	5.66	5.87	6.09	6.30	6.52	6.73	6.94	7.16	7.37	7.59	7.80	8.02
50	1.03	1.25	1.46	1.68	1.89	2.11	2.32	2.54	2.75	2.96	3.18	3.39	3.61	3.82	4.04	4.25	4.46	4.68	4.89	5.11	5.32	5.54	5.75	5.96	6.18	6.39	6.61	6.82	7.04	7.25	7.47
49	.48	.70	.91	1.13	1.34	1.56	1.77	1.98	2.20	2.41	2.63	2.84	3.06	3.27	3.48	3.70	3.91	4.13	4.34	4.56	4.77	4.99	5.20	5.41	5.63	5.84	6.06	6.27	6.49	6.70	6.92
48	.07	.15	.36	.58	.79	1.01	1.22	1.43	1.65	1.86	2.08	2.29	2.51	2.72	2.93	3.15	3.36	3.58	3.79	4.01	4.22	4.44	4.65	4.86	5.08	5.29	5.51	5.72	5.94	6.15	6.37

Interpolation Table

Chest Circumference	Knee
.1	.055
.2	.110
.3	.165
.4	.220
.5	.275
.6	.330
.7	.385
.8	.440
.9	.495

Table 62

Predicting Weight (Kilograms) of Girls, Age Nine Years, From Height, Hips,
Chest Circumference and Knee (Centimeters)

Height, Centi- meters	Hip Width, Centimeters																					
	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.4	20.8	21.2	21.6	22.0	22.4	22.8	23.2	23.6	24.0	24.4	24.8	25.2	25.6
156.0	20.41	20.53	20.66	20.79	20.91	21.04	21.16	21.29	21.41	21.54	21.66	21.79	21.92	22.04	22.17	22.29	22.42	22.54	22.67	22.79	22.92	23.04
154.5	20.21	20.33	20.46	20.58	20.71	20.83	20.96	21.08	21.21	21.33	21.46	21.58	21.71	21.83	21.96	22.08	22.21	22.33	22.46	22.58	22.71	22.83
153.0	20.00	20.12	20.25	20.37	20.50	20.62	20.75	20.87	21.00	21.12	21.25	21.37	21.50	21.62	21.75	21.87	22.00	22.12	22.25	22.37	22.50	22.62
151.5	19.79	19.91	20.04	20.16	20.29	20.41	20.54	20.66	20.79	20.91	21.04	21.16	21.29	21.41	21.54	21.66	21.79	21.91	22.04	22.16	22.29	22.41
150.0	19.58	19.70	19.83	19.95	20.08	20.20	20.33	20.46	20.58	20.71	20.83	20.96	21.08	21.21	21.33	21.46	21.58	21.71	21.83	21.96	22.08	22.21
148.5	19.37	19.50	19.62	19.75	19.87	20.00	20.12	20.25	20.37	20.50	20.62	20.75	20.87	21.00	21.12	21.25	21.37	21.50	21.62	21.75	21.87	22.00
147.0	19.16	19.29	19.41	19.54	19.66	19.79	19.91	20.04	20.16	20.29	20.41	20.54	20.66	20.79	20.91	21.04	21.16	21.29	21.41	21.54	21.66	21.79
145.5	18.95	19.08	19.20	19.33	19.45	19.58	19.70	19.83	19.95	20.08	20.20	20.33	20.45	20.58	20.70	20.83	20.95	21.08	21.21	21.33	21.46	21.58
144.0	18.74	18.87	19.00	19.12	19.25	19.37	19.50	19.62	19.75	19.87	20.00	20.12	20.25	20.37	20.50	20.62	20.75	20.87	21.00	21.12	21.25	21.37
142.5	18.54	18.66	18.79	18.91	19.04	19.16	19.29	19.41	19.54	19.66	19.79	19.91	20.04	20.16	20.29	20.41	20.54	20.66	20.79	20.91	21.04	21.16
141.0	18.33	18.45	18.58	18.70	18.83	18.95	19.08	19.20	19.33	19.45	19.58	19.70	19.83	19.95	20.08	20.20	20.33	20.45	20.58	20.70	20.83	20.95
139.5	18.12	18.24	18.37	18.49	18.62	18.74	18.87	18.99	19.12	19.25	19.37	19.49	19.62	19.75	19.87	20.00	20.12	20.25	20.37	20.50	20.62	20.75
138.0	17.91	18.04	18.16	18.29	18.41	18.54	18.66	18.79	18.91	19.04	19.16	19.29	19.41	19.54	19.66	19.79	19.91	20.04	20.16	20.29	20.41	20.54
136.5	17.70	17.83	17.95	18.08	18.20	18.33	18.45	18.58	18.70	18.83	18.95	19.08	19.20	19.33	19.45	19.58	19.70	19.83	19.95	20.08	20.20	20.33
135.0	17.49	17.62	17.74	17.87	17.99	18.12	18.24	18.37	18.49	18.62	18.74	18.87	18.99	19.12	19.24	19.37	19.49	19.62	19.74	19.87	19.99	20.12
133.5	17.28	17.41	17.53	17.66	17.78	17.91	18.03	18.16	18.29	18.41	18.54	18.66	18.79	18.91	19.04	19.16	19.29	19.41	19.54	19.66	19.79	19.91
132.0	17.08	17.20	17.33	17.45	17.58	17.70	17.83	17.95	18.08	18.20	18.33	18.45	18.58	18.70	18.83	18.95	19.08	19.20	19.33	19.45	19.58	19.70
130.5	16.87	16.99	17.12	17.24	17.37	17.49	17.62	17.74	17.87	17.99	18.12	18.24	18.37	18.49	18.62	18.74	18.87	18.99	19.12	19.24	19.37	19.49
129.0	16.66	16.78	16.91	17.03	17.16	17.28	17.41	17.53	17.66	17.79	17.91	18.03	18.16	18.28	18.41	18.53	18.66	18.78	18.91	19.03	19.16	19.29
127.5	16.45	16.57	16.70	16.83	16.95	17.08	17.20	17.33	17.45	17.58	17.70	17.83	17.95	18.08	18.20	18.33	18.45	18.58	18.70	18.83	18.95	19.08
126.0	16.24	16.37	16.49	16.62	16.74	16.87	16.99	17.12	17.24	17.37	17.49	17.62	17.74	17.87	17.99	18.12	18.24	18.37	18.49	18.62	18.74	18.87
124.5	16.03	16.16	16.28	16.41	16.53	16.66	16.78	16.91	17.03	17.16	17.28	17.41	17.53	17.66	17.78	17.91	18.03	18.16	18.28	18.41	18.53	18.66
123.0	15.82	15.95	16.07	16.20	16.32	16.45	16.57	16.70	16.82	16.95	17.07	17.20	17.32	17.45	17.57	17.70	17.83	17.95	18.08	18.20	18.33	18.45
121.5	15.62	15.74	15.87	15.99	16.12	16.24	16.37	16.49	16.62	16.74	16.87	16.99	17.12	17.24	17.37	17.49	17.62	17.74	17.87	17.99	18.12	18.24
120.0	15.41	15.53	15.66	15.78	15.91	16.03	16.16	16.28	16.41	16.53	16.66	16.78	16.91	17.03	17.16	17.28	17.41	17.53	17.66	17.78	17.91	18.03
118.5	15.20	15.32	15.45	15.57	15.70	15.82	15.95	16.07	16.20	16.32	16.45	16.57	16.70	16.82	16.95	17.07	17.20	17.32	17.45	17.57	17.70	17.82
117.0	14.99	15.11	15.24	15.36	15.49	15.61	15.74	15.86	15.99	16.12	16.24	16.37	16.49	16.62	15.74	15.87	16.99	17.12	17.24	17.37	17.49	17.62
115.5	14.78	14.91	15.03	15.16	15.28	15.41	15.53	15.66	15.78	15.91	16.03	16.15	16.28	16.41	16.53	16.66	16.78	16.91	17.03	17.16	17.28	17.41
114.0	14.57	14.70	14.82	14.95	15.07	15.20	15.32	15.45	15.57	15.70	15.82	15.95	16.07	16.20	16.32	16.45	16.57	16.70	16.82	16.95	17.07	17.20

Interpolation Table

Height	Hips			
	0	.1	.2	.3
0	0	.03	.06	.09
.1	.01	.05	.08	.11
.2	.03	.06	.09	.12
.3	.04	.07	.10	.14
.4	.06	.09	.12	.15
.5	.07	.10	.13	.16
.6	.08	.11	.15	.18
.7	.10	.13	.16	.19
.8	.11	.14	.17	.21
.9	.13	.16	.19	.22
1.0	.14	.17	.20	.23
1.1	.15	.18	.22	.25
1.2	.17	.20	.23	.26
1.3	.18	.21	.24	.27
1.4	.19	.23	.26	.29

Table 63

Predicting Weight (Kilograms) of Girls, Age Nine Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1391 height + .3127 hips + .7506 chest circumference + 1.9510 knee - 56.6639; R = .9481)

Chest Circumference, Centimeters	Knee Width, Centimeters																																	
	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6
72	16.33	16.53	16.72	16.92	17.11	17.31	17.51	17.70	17.90	18.09	18.29	18.48	18.68	18.87	19.07	19.26	19.46	19.65	19.85	20.04	20.24	20.43	20.63	20.82	21.02	21.21	21.41	21.60	21.80	21.99	22.19	22.38	22.58	22.77
71	15.58	15.78	15.97	16.17	16.36	16.56	16.75	16.95	17.14	17.34	17.53	17.73	17.93	18.12	18.32	18.51	18.71	18.90	19.10	19.29	19.49	19.68	19.88	20.07	20.27	20.46	20.66	20.85	21.05	21.24	21.44	21.63	21.83	22.02
70	14.83	15.03	15.22	15.42	15.61	15.81	16.00	16.20	16.39	16.59	16.78	16.98	17.17	17.37	17.56	17.76	17.95	18.15	18.35	18.54	18.74	18.93	19.13	19.32	19.52	19.71	19.91	20.10	20.30	20.49	20.69	20.88	21.08	21.27
69	14.08	14.28	14.47	14.67	14.86	15.06	15.25	15.45	15.64	15.84	16.03	16.23	16.42	16.62	16.81	17.01	17.20	17.40	17.59	17.79	17.98	18.18	18.37	18.57	18.77	18.96	19.16	19.35	19.55	19.74	19.94	20.13	20.33	20.52
68	13.32	13.53	13.72	13.91	14.11	14.31	14.50	14.70	14.89	15.09	15.28	15.48	15.67	15.87	16.06	16.26	16.45	16.65	16.84	17.04	17.23	17.43	17.62	17.82	18.01	18.21	18.40	18.60	18.79	18.99	19.19	19.38	19.58	19.77
67	12.58	12.78	12.97	13.17	13.36	13.56	13.75	13.95	14.14	14.34	14.53	14.73	14.92	15.12	15.31	15.51	15.70	15.90	16.09	16.29	16.48	16.68	16.87	17.07	17.26	17.46	17.65	17.85	18.04	18.24	18.44	18.63	18.82	19.02
66	11.83	12.03	12.22	12.42	12.61	12.81	13.00	13.20	13.39	13.59	13.78	13.98	14.17	14.37	14.56	14.76	14.95	15.15	15.34	15.54	15.73	15.93	16.12	16.32	16.51	16.71	16.90	17.10	17.29	17.49	17.68	17.88	18.07	18.27
65	11.08	11.28	11.47	11.67	11.86	12.06	12.25	12.45	12.64	12.84	13.03	13.23	13.42	13.62	13.81	14.01	14.20	14.40	14.59	14.79	14.98	15.18	15.37	15.57	15.76	15.96	16.15	16.35	16.54	16.74	16.93	17.13	17.32	17.52
64	10.33	10.52	10.72	10.92	11.11	11.31	11.50	11.70	11.89	12.09	12.28	12.48	12.67	12.87	13.06	13.26	13.45	13.65	13.84	14.04	14.23	14.43	14.62	14.82	15.01	15.21	15.40	15.60	15.79	15.99	16.18	16.38	16.57	16.77
63	9.58	9.77	9.97	10.16	10.36	10.55	10.75	10.94	11.14	11.34	11.53	11.73	11.92	12.12	12.31	12.51	12.70	12.90	13.09	13.29	13.48	13.68	13.87	14.07	14.26	14.46	14.65	14.85	15.04	15.24	15.43	15.63	15.82	16.02
62	8.83	9.02	9.22	9.41	9.61	9.80	10.00	10.19	10.39	10.58	10.78	10.97	11.17	11.36	11.56	11.76	11.95	12.15	12.34	12.54	12.73	12.93	13.12	13.32	13.51	13.71	13.90	14.10	14.29	14.49	14.68	14.88	15.07	15.27
61	8.08	8.27	8.47	8.66	8.86	9.05	9.25	9.44	9.64	9.83	10.03	10.22	10.42	10.61	10.81	11.00	11.20	11.39	11.59	11.78	11.98	12.18	12.37	12.57	12.76	12.96	13.15	13.35	13.54	13.74	13.93	14.13	14.32	14.52
60	7.33	7.52	7.71	7.91	8.11	8.30	8.50	8.69	8.89	9.08	9.28	9.47	9.67	9.86	10.06	10.25	10.45	10.64	10.84	11.03	11.23	11.42	11.62	11.81	12.01	12.20	12.40	12.60	12.79	12.99	13.18	13.38	13.57	13.77
59	6.58	6.77	6.97	7.16	7.36	7.55	7.75	7.94	8.14	8.33	8.53	8.72	8.92	9.11	9.31	9.50	9.70	9.89	10.09	10.28	10.48	10.67	10.87	11.06	11.26	11.45	11.65	11.84	12.04	12.23	12.43	12.62	12.82	13.02
58	5.83	6.02	6.22	6.41	6.61	6.80	7.00	7.19	7.39	7.58	7.78	7.97	8.17	8.36	8.56	8.75	8.95	9.14	9.34	9.53	9.73	9.92	10.12	10.31	10.51	10.70	10.90	11.09	11.29	11.48	11.68	11.87	12.07	12.26
57	5.08	5.27	5.47	5.66	5.86	6.05	6.25	6.44	6.64	6.83	7.03	7.22	7.42	7.61	7.81	8.00	8.20	8.39	8.59	8.78	8.98	9.17	9.37	9.56	9.76	9.95	10.15	10.34	10.54	10.73	10.93	11.12	11.32	11.51
56	4.32	4.52	4.72	4.91	5.11	5.30	5.50	5.69	5.89	6.08	6.28	6.47	6.67	6.86	7.06	7.25	7.45	7.64	7.84	8.03	8.23	8.42	8.62	8.81	9.01	9.20	9.40	9.59	9.79	9.98	10.18	10.37	10.57	10.76
55	3.57	3.77	3.96	4.16	4.35	4.55	4.74	4.94	5.14	5.33	5.53	5.72	5.92	6.11	6.31	6.50	6.70	6.89	7.09	7.28	7.48	7.67	7.87	8.06	8.26	8.45	8.65	8.84	9.04	9.23	9.43	9.62	9.82	10.01
54	2.82	3.02	3.21	3.41	3.60	3.80	3.99	4.19	4.38	4.58	4.77	4.97	5.16	5.36	5.56	5.75	5.95	6.14	6.34	6.53	6.73	6.92	7.12	7.31	7.51	7.70	7.90	8.09	8.29	8.48	8.68	8.87	9.07	9.26
53	2.07	2.27	2.46	2.66	2.85	3.05	3.24	3.44	3.63	3.83	4.02	4.22	4.41	4.61	4.80	5.00	5.19	5.39	5.58	5.78	5.98	6.17	6.37	6.56	6.76	6.95	7.15	7.34	7.54	7.73	7.93	8.12	8.32	8.51
52	1.32	1.51	1.71	1.91	2.10	2.30	2.49	2.69	2.88	3.08	3.27	3.47	3.66	3.86	4.05	4.25	4.44	4.64	4.83	5.03	5.22	5.42	5.61	5.81	6.00	6.20	6.40	6.59	6.79	6.98	7.18	7.37	7.57	7.76
51	0.57	0.77	0.96	1.16	1.35	1.55	1.74	1.94	2.13	2.33	2.52	2.72	2.91	3.11	3.30	3.50	3.69	3.89	4.08	4.28	4.47	4.67	4.86	5.06	5.25	5.45	5.64	5.84	6.03	6.23	6.42	6.62	6.82	7.01
50	-0.18	0.02	0.21	0.41	0.60	0.80	0.99	1.19	1.38	1.58	1.77	1.97	2.16	2.36	2.55	2.75	2.94	3.14	3.33	3.53	3.72	3.92	4.11	4.31	4.50	4.70	4.89	5.09	5.28	5.48	5.67	5.87	6.06	6.26
49	-0.93	-0.73	-0.54	-0.34	-0.15	0.05	0.24	0.44	0.63	0.83	1.02	1.22	1.41	1.61	1.80	2.00	2.19	2.39	2.58	2.78	2.97	3.17	3.36	3.56	3.75	3.95	4.14	4.34	4.53	4.73	4.92	5.12	5.31	5.51

Interpolation Table

Chest Circumference	Knee
.1	.075
.2	.150
.3	.225
.4	.300
.5	.375
.6	.450
.7	.525
.8	.600
.9	.676

Table 64

Predicting Weight (Kilograms) of Girls, Age Ten Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .0966 height + .7730 hips + .7034 chest circumference + 2.4933 knee - 61.8757; R = .9315)

Height, Centimeters	Hip Width, Centimeters																						
	18.8	19.2	19.6	20.0	20.4	20.8	21.2	21.6	22.0	22.4	22.8	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6
164	18.50	18.81	19.12	19.43	19.74	20.05	20.35	20.66	20.97	21.28	21.59	21.90	22.21	22.52	22.83	23.14	23.45	23.76	24.06	24.37	24.68	24.99	25.30
162	18.31	18.62	18.92	19.23	19.54	19.85	20.16	20.47	20.78	21.09	21.40	21.71	22.02	22.33	22.63	22.94	23.25	23.56	23.87	24.18	24.49	24.79	25.11
160	18.11	18.42	18.73	19.04	19.35	19.66	19.97	20.28	20.59	20.90	21.20	21.51	21.82	22.13	22.44	22.75	23.06	23.37	23.68	23.99	24.30	24.61	24.92
158	17.92	18.23	18.54	18.85	19.16	19.47	19.77	20.08	20.39	20.70	21.01	21.32	21.63	21.94	22.25	22.56	22.87	23.18	23.49	23.79	24.10	24.41	24.72
156	17.73	18.04	18.34	18.65	18.96	19.27	19.58	19.89	20.20	20.51	20.82	21.13	21.44	21.75	22.06	22.36	22.67	22.98	23.29	23.60	23.91	24.22	24.53
154	17.53	17.84	18.15	18.46	18.77	19.08	19.39	19.70	20.01	20.32	20.63	20.93	21.24	21.55	21.86	22.17	22.48	22.79	23.10	23.41	23.72	24.03	24.34
152	17.34	17.65	17.96	18.27	18.58	18.89	19.20	19.50	19.81	20.12	20.43	20.74	21.05	21.36	21.67	21.98	22.29	22.60	22.91	23.21	23.52	23.83	24.14
150	17.15	17.46	17.77	18.07	18.38	18.69	19.00	19.31	19.62	19.93	20.24	20.55	20.86	21.17	21.48	21.78	22.09	22.40	22.71	23.02	23.33	23.64	23.95
148	16.95	17.26	17.57	17.88	18.19	18.50	18.81	19.12	19.43	19.74	20.05	20.35	20.66	20.97	21.28	21.59	21.90	22.21	22.52	22.83	23.14	23.45	23.76
146	16.76	17.07	17.38	17.69	18.00	18.31	18.62	18.92	19.23	19.54	19.85	20.16	20.47	20.78	21.09	21.40	21.71	22.02	22.33	22.64	22.94	23.25	23.56
144	16.57	16.88	17.19	17.49	17.80	18.11	18.42	18.73	19.04	19.35	19.66	19.97	20.28	20.59	20.90	21.21	21.51	21.82	22.13	22.44	22.75	23.06	23.37
142	16.37	16.68	16.99	17.30	17.61	17.92	18.23	18.54	18.85	19.16	19.47	19.78	20.08	20.39	20.70	21.01	21.32	21.63	21.94	22.25	22.56	22.87	23.18
140	16.18	16.49	16.80	17.11	17.42	17.73	18.04	18.35	18.65	18.96	19.27	19.58	19.89	20.20	20.51	20.82	21.13	21.44	21.75	22.06	22.36	22.67	22.98
138	15.99	16.30	16.61	16.92	17.22	17.53	17.84	18.15	18.46	18.77	19.08	19.39	19.70	20.01	20.32	20.63	20.93	21.24	21.55	21.86	22.17	22.48	22.79
136	15.79	16.10	16.41	16.72	17.03	17.34	17.65	17.96	18.27	18.58	18.89	19.20	19.50	19.81	20.12	20.43	20.74	21.05	21.36	21.67	21.98	22.29	22.60
134	15.60	15.91	16.22	16.53	16.84	17.15	17.46	17.77	18.07	18.38	18.69	19.00	19.31	19.62	19.93	20.24	20.55	20.86	21.17	21.48	21.79	22.09	22.40
132	15.41	15.72	16.03	16.34	16.64	16.95	17.26	17.57	17.88	18.19	18.50	18.81	19.12	19.43	19.74	20.05	20.36	20.66	20.97	21.28	21.59	21.90	22.21
130	15.21	15.52	15.83	16.14	16.45	16.76	17.07	17.38	17.69	18.00	18.31	18.62	18.93	19.23	19.54	19.85	20.16	20.47	20.78	21.09	21.40	21.71	22.02
128	15.02	15.33	15.64	15.95	16.26	16.57	16.88	17.19	17.50	17.80	18.11	18.42	18.73	19.04	19.35	19.66	19.97	20.28	20.59	20.90	21.21	21.51	21.82
126	14.83	15.14	15.45	15.76	16.07	16.37	16.68	16.99	17.30	17.61	17.92	18.23	18.54	18.85	19.16	19.47	19.78	20.08	20.39	20.70	21.01	21.32	21.63
124	14.64	14.94	15.25	15.56	15.87	16.18	16.49	16.80	17.11	17.42	17.73	18.04	18.35	18.65	18.96	19.27	19.58	19.89	20.20	20.51	20.82	21.13	21.44
122	14.44	14.75	15.06	15.37	15.68	15.99	16.30	16.61	16.92	17.22	17.53	17.84	18.15	18.46	18.77	19.08	19.39	19.70	20.01	20.32	20.63	20.94	21.24
120	14.25	14.56	14.87	15.18	15.49	15.79	16.10	16.41	16.72	17.03	17.34	17.65	17.96	18.27	18.58	18.89	19.20	19.51	19.81	20.12	20.43	20.74	21.05
118	14.06	14.36	14.67	14.98	15.29	15.60	15.91	16.22	16.53	16.84	17.15	17.46	17.77	18.08	18.38	18.69	19.00	19.31	19.62	19.93	20.24	20.55	20.86

Interpolation Table

Height	Hips			
	0	.1	.2	.3
0	0	.08	.15	.23
.1	.01	.09	.16	.24
.2	.02	.10	.17	.25
.3	.03	.11	.18	.26
.4	.04	.12	.19	.27
.5	.05	.13	.20	.28
.6	.06	.14	.21	.29
.7	.07	.15	.22	.30
.8	.08	.15	.23	.31
.9	.09	.16	.24	.32
1.0	.10	.17	.25	.33
1.1	.11	.18	.26	.34
1.2	.12	.19	.27	.35
1.3	.13	.20	.28	.36
1.4	.14	.21	.29	.37
1.5	.15	.22	.30	.38
1.6	.16	.23	.31	.39
1.7	.16	.24	.32	.40
1.8	.17	.25	.33	.41
1.9	.18	.26	.34	.42

Table 65

Predicting Weight (Kilograms) of Girls, Age Ten Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																												
	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6
73.6	18.72	18.97	19.22	19.47	19.72	19.97	20.22	20.47	20.72	20.97	21.22	21.47	21.72	21.97	22.22	22,46	22.71	22.96	23.21	23.46	23.71	23.96	24.21	24.46	24.71	24.96	25.21	25.46	25.71
72.8	18.16	18.41	18.66	18.91	19.16	19.41	19.66	19.91	20.16	20.41	20.66	20.90	21.15	21.40	21.65	21.90	22.15	22.40	22.65	22.90	23.15	23.40	23.65	23.90	24.15	24.40	24.64	24.89	25.14
72.0	17.60	17.85	18.10	18.35	18.60	18.85	19.10	19.34	19.59	19.84	20.09	20.34	20.59	20.84	21.09	21.34	21.59	21.84	22.09	22.34	22.59	22.84	23.08	23.33	23.58	23.83	24.08	24.33	24.58
71.2	17.04	17.29	17.54	17.78	18.03	18.28	18.53	18.78	19.03	19.28	19.53	19.78	20.03	20.28	20.53	20.78	21.03	21.28	21.52	21.77	22.02	22.27	22.52	22.77	23.02	23.27	23.52	23.77	24.02
70.4	16.47	16.72	16.97	17.22	17.47	17.72	17.97	18.22	18.47	18.72	18.97	19.22	19.47	19.72	19.96	20.21	20.46	20.71	20.96	21.21	21.46	21.71	21.96	22.21	22.46	22.71	22.96	23.21	23.46
69.6	15.91	16.16	16.41	16.66	16.91	17.16	17.41	17.66	17.91	18.16	18.40	18.65	18.90	19.15	19.40	19.65	19.90	20.15	20.40	20.15	20.90	21.15	21.40	21.65	21.90	22.14	22.39	22.64	22.89
68.8	15.35	15.60	15.85	16.10	16.35	16.60	16.84	17.09	17.34	17.59	17.84	18.09	18.34	18.59	18.84	19.09	19.34	19.59	19.84	20.09	20.33	20.58	20.83	21.08	21.33	21.58	21.83	22.08	22.33
68.0	14.79	15.03	15.28	15.53	15.78	16.03	16.28	16.53	16.78	17.03	17.28	17.53	17.78	18.03	18.28	18.53	18.77	19.02	19.27	19.52	19.77	20.02	20.27	20.52	20.77	21.02	21.27	21.52	21.77
67.2	14.22	14.47	14.72	14.97	15.22	15.47	15.72	15.97	16.22	16.47	16.72	16.97	17.21	17.46	17.71	17.96	18.21	18.46	18.71	18.96	19.21	19.46	19.71	19.96	20.21	20.46	20.71	20.95	21.20
66.4	13.66	13.91	14.16	14.41	14.66	14.91	15.16	15.41	15.65	15.90	16.15	16.40	16.65	16.90	17.15	17.40	17.65	17.90	18.15	18.40	18.65	18.90	19.15	19.39	19.64	19.89	20.14	20.39	20.64
65.6	13.10	13.35	13.60	13.85	14.09	14.34	14.59	14.84	15.09	15.34	15.59	15.84	16.09	16.34	16.59	16.84	17.09	17.34	17.59	17.83	18.08	18.33	18.58	18.83	19.08	19.33	19.58	19.83	20.08
64.8	12.53	12.78	13.03	13.28	13.53	13.78	14.03	14.28	14.53	14.78	15.03	15.28	15.53	15.78	16.03	16.27	16.52	16.77	17.02	17.27	17.52	17.77	18.02	18.27	18.52	18.77	19.02	19.27	19.52
64.0	11.97	12.22	12.47	12.72	12.97	13.22	13.47	13.72	13.97	14.22	14.47	14.71	14.96	15.21	15.46	15.71	15.96	16.21	16.46	16.71	16.96	17.21	17.46	17.71	17.96	18.21	18.45	18.70	18.95
63.2	11.41	11.56	11.91	12.16	12.41	12.66	12.91	13.15	13.40	13.65	13.90	14.15	14.40	14.65	14.90	15.15	15.40	15.65	15.90	16.15	16.40	16.65	16.89	17.14	17.39	17.64	17.89	18.14	18.39
62.4	10.85	11.10	11.35	11.59	11.84	12.09	12.34	12.59	12.84	13.09	13.34	13.59	13.84	14.09	14.34	14.59	14.84	15.09	15.33	15.58	15.83	16.08	16.33	16.58	16.83	17.08	17.33	17.58	17.83
61.6	10.28	10.53	10.78	11.03	11.28	11.53	11.78	12.03	12.28	12.53	12.78	13.03	13.28	13.53	13.77	14.02	14.27	14.52	14.77	15.02	15.27	15.52	15.77	16.02	16.27	16.52	16.77	17.02	17.27
60.8	9.72	9.97	10.22	10.47	10.72	10.97	11.22	11.47	11.72	11.97	12.21	12.46	12.71	12.96	13.21	13.46	13.71	13.96	14.21	14.46	14.71	14.96	15.21	15.46	15.71	15.95	16.20	16.45	16.70
60.0	9.16	9.41	9.66	9.91	10.16	10.41	10.65	10.90	11.15	11.40	11.65	11.90	12.15	12.40	12.65	12.90	13.15	13.40	13.65	13.90	14.15	14.39	14.64	14.89	15.14	15.39	15.64	15.89	16.14
59.2	8.60	8.85	9.09	9.34	9.59	9.84	10.09	10.34	10.59	10.84	11.09	11.34	11.59	11.84	12.09	12.34	12.59	12.83	13.08	13.33	13.58	13.83	14.08	14.33	14.58	14.83	15.08	15.33	15.58
58.4	8.03	8.28	8.53	8.78	9.03	9.28	9.53	9.78	10.03	10.28	10.53	10.78	11.02	11.27	11.52	11.77	12.02	12.27	12.52	12.77	13.02	13.27	13.52	13.77	14.02	14.27	14.52	14.76	15.01
57.6	7.47	7.72	7.97	8.22	8.47	8.72	8.97	9.22	9.46	9.71	9.96	10.21	10.46	10.71	10.96	11.21	11.46	11.71	11.96	12.21	12.46	12.71	12.96	13.20	13.45	13.70	13.95	14.20	14.45
56.8	6.91	7.16	7.41	7.66	7.90	8.15	8.40	8.65	8.90	9.15	9.40	9.65	9.90	10.15	10.40	10.65	10.90	11.15	11.40	11.64	11.89	12.14	12.39	12.64	12.89	13.14	13.39	13.64	13.89
56.0	6.34	6.59	6.84	7.09	7.34	7.59	7.84	8.09	8.34	8.59	8.84	9.09	9.34	9.59	9.84	10.08	10.33	10.58	10.83	11.08	11.33	11.58	11.83	12.08	12.33	12.58	12.83	13.08	13.33
55.2	5.78	6.03	6.28	6.53	6.78	7.03	7.28	7.53	7.78	8.03	8.28	8.52	8.77	9.02	9.27	9.52	9.77	10.02	10.27	10.52	10.77	11.02	11.27	11.52	11.77	12.02	12.26	12.51	12.76
54.4	5.22	5.47	5.72	5.97	6.22	6.47	6.72	6.96	7.21	7.46	7.71	7.96	8.21	8.46	8.71	8.96	9.21	9.46	9.71	9.96	10.21	10.46	10.70	10.95	11.20	11.45	11.70	10.95	12.20
53.6	4.66	4.91	5.16	5.40	5.65	5.90	6.15	6.40	6.65	6.90	7.15	7.40	7.65	7.90	8.15	8.40	8.65	8.90	9.14	9.39	9.64	9.89	10.14	10.39	10.64	10.89	11.14	11.39	11.64
52.8	4.09	4.34	4.59	4.84	5.09	5.34	5.59	5.84	6.09	6.34	6.59	6.84	7.09	7.34	7.58	7.83	8.08	8.33	8.58	8.83	9.08	9.33	9.58	9.83	10.08	10.33	10.58	10.83	11.08
52.0	3.53	3.78	4.03	4.28	4.53	4.78	5.03	5.28	5.53	5.78	6.02	6.27	6.52	6.77	7.02	7.27	7.52	7.77	8.02	8.27	8.52	8.77	9.02	9.27	9.52	9.76	10.01	10.26	10.51
51.2	2.97	3.22	3.47	3.72	3.97	4.22	4.46	4.71	4.96	5.21	5.46	5.71	5.96	6.21	6.46	6.71	6.96	7.21	7.46	7.71	7.96	8.20	8.45	8.70	8.95	9.20	9.45	9.70	9.95

Interpolation Table

Chest Circumference	Knee
.1	.070
.2	.141
.3	.211
.4	.281
.5	.352
.6	.422
.7	.492

Table 66

Predicting Weight (Kilograms) of Girls, Age Eleven Years, From Height, Hips,
Chest Circumference and Knee (Centimeters) (Weight = .1593 height
+ .8849 hips + .5217 chest circumference + 2.3366
knee - 60.2732; R = .9385)

Height, Centi-meters	Hip Width, Centimeters																						
	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0
170	22.74	23.18	23.62	24.06	24.51	24.95	25.39	25.83	26.28	26.72	27.16	27.60	28.05	28.49	28.93	29.37	29.82	30.26	30.70	31.14	31.59	32.03	32.47
168	22.42	22.86	23.30	23.74	24.19	24.63	25.07	25.51	25.96	26.40	26.84	27.28	27.73	28.17	28.61	29.05	29.50	29.94	30.38	30.82	31.27	31.71	32.15
166	22.10	22.54	22.98	23.43	23.87	24.31	24.75	25.20	25.64	26.08	26.52	26.97	27.41	27.85	28.29	28.74	29.18	29.62	30.06	30.51	30.95	31.39	31.83
164	21.78	22.22	22.67	23.11	23.55	23.99	24.43	24.88	25.32	25.76	26.20	26.65	27.09	27.53	27.97	28.42	28.86	29.30	29.74	30.19	30.63	31.07	31.51
162	21.46	21.90	22.35	22.79	23.23	23.67	24.12	24.56	25.00	25.44	25.89	26.33	26.77	27.21	27.66	28.10	28.54	28.98	29.43	29.87	30.31	30.75	31.20
160	21.14	21.59	22.03	22.47	22.91	23.36	23.80	24.24	24.68	25.13	25.57	26.01	26.45	26.89	27.34	27.78	28.22	28.66	29.11	29.55	29.99	30.43	30.88
158	20.82	21.27	21.71	22.15	22.59	23.04	23.48	23.92	24.36	24.81	25.25	25.69	26.13	26.58	27.02	27.46	27.90	28.35	28.79	29.23	29.67	30.12	30.56
156	20.51	20.95	21.39	21.83	22.28	22.72	23.16	23.60	24.05	24.49	24.93	25.37	25.82	26.26	26.70	27.14	27.59	28.03	28.47	28.91	29.35	29.80	30.24
154	20.19	20.63	21.07	21.51	21.96	22.40	22.84	23.28	23.73	24.17	24.61	25.05	25.50	25.94	26.38	26.82	27.27	27.71	28.15	28.59	29.04	29.48	29.92
152	19.87	20.31	20.75	21.20	21.64	22.08	22.52	22.97	23.41	23.85	24.29	24.74	25.18	25.62	26.06	26.51	26.95	27.39	27.83	28.28	28.72	29.16	29.60
150	19.55	19.99	20.43	20.88	21.32	21.76	22.20	22.65	23.09	23.53	23.97	24.42	24.86	25.30	25.74	26.19	26.63	27.07	27.51	27.96	28.40	28.84	29.28
148	19.23	19.67	20.12	20.56	21.00	21.44	21.89	22.33	22.77	23.21	23.66	24.10	24.54	24.98	25.43	25.87	26.31	26.75	27.20	27.64	28.08	28.52	28.97
146	18.91	19.36	19.80	20.24	20.68	21.13	21.57	22.01	22.45	22.89	23.34	23.78	24.22	24.66	25.11	25.55	25.99	26.43	26.88	27.32	27.76	28.20	28.65
144	18.59	19.04	19.48	19.92	20.36	20.81	21.25	21.69	22.13	22.58	23.02	23.46	23.90	24.35	24.79	25.23	25.67	26.12	26.56	27.00	27.44	27.89	28.33
142	18.28	18.72	19.16	19.60	20.05	20.49	20.93	21.37	21.82	22.26	22.70	23.14	23.59	24.03	24.47	24.91	25.35	25.80	26.24	26.68	27.12	27.57	28.01
140	17.96	18.40	18.84	19.28	19.73	20.17	20.61	21.05	21.50	21.94	22.38	22.82	23.27	23.71	24.15	24.59	25.04	25.48	25.92	26.36	26.81	27.25	27.69
138	17.64	18.08	18.52	18.97	19.41	19.85	20.29	20.74	21.18	21.62	22.06	22.51	22.95	23.39	23.83	24.28	24.72	25.16	25.60	26.04	26.49	26.93	27.37
136	17.32	17.76	18.20	18.65	19.09	19.53	19.97	20.42	20.86	21.30	21.74	22.19	22.63	23.07	23.51	23.96	24.40	24.84	25.28	25.73	26.17	26.61	27.05
134	17.00	17.44	17.89	18.33	18.77	19.21	19.66	20.10	20.54	20.98	21.43	21.87	22.31	22.75	23.20	23.64	24.08	24.52	24.97	25.41	25.85	26.29	26.74
132	16.68	17.13	17.57	18.01	18.45	18.89	19.34	19.78	20.22	20.66	21.11	21.55	21.99	22.43	22.88	23.32	23.76	24.20	24.65	25.09	25.53	25.97	26.42
130	16.36	16.81	17.25	17.69	18.13	18.58	19.02	19.46	19.90	20.35	20.79	21.23	21.67	22.12	22.56	23.00	23.44	23.89	24.33	24.77	25.21	25.66	26.10
128	16.05	16.49	16.93	17.37	17.82	18.26	18.70	19.14	19.59	20.03	20.47	20.91	21.35	21.80	22.24	22.68	23.12	23.57	24.01	24.45	24.89	25.34	25.78
126	15.73	16.17	16.61	17.05	17.50	17.94	18.38	18.82	19.27	19.71	20.15	20.59	21.04	21.48	21.92	22.36	22.81	23.25	23.69	24.13	24.58	25.02	25.46
124	15.41	15.85	16.29	16.74	17.18	17.62	18.06	18.51	18.95	19.39	19.83	20.28	20.72	21.16	21.60	22.04	22.49	22.93	23.37	23.81	24.26	24.70	25.14
122	15.09	15.53	15.97	16.42	16.86	17.30	17.74	18.19	18.63	19.07	19.51	19.96	20.40	20.84	21.28	21.73	22.17	22.61	23.05	23.50	23.94	24.38	24.82
120	14.77	15.21	15.66	16.10	16.54	16.98	17.43	17.87	18.31	18.75	19.20	19.64	20.08	20.52	20.97	21.41	21.85	22.29	22.74	23.18	23.62	24.06	24.50
118	14.45	14.89	15.35	15.78	16.22	16.66	17.11	17.55	17.99	18.43	18.88	19.32	19.76	20.20	20.65	21.09	21.53	21.97	22.42	22.86	23.30	23.74	24.19
116	14.13	14.58	15.02	15.46	15.90	16.35	16.79	17.23	17.67	18.12	18.56	19.00	19.44	19.89	20.33	20.77	21.21	21.66	22.10	22.54	22.98	23.43	23.87

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.09	.18	.27	.35
.1	.02	.10	.19	.28	.37
.2	.03	.12	.21	.30	.39
.3	.05	.14	.22	.31	.40
.4	.06	.15	.24	.33	.42
.5	.08	.17	.26	.35	.43
.6	.10	.18	.27	.36	.45
.7	.11	.20	.29	.38	.47
.8	.13	.22	.30	.39	.48
.9	.14	.23	.32	.41	.50
1.0	.16	.25	.34	.43	.51
1.1	.18	.26	.35	.44	.53
1.2	.19	.28	.37	.46	.55
1.3	.21	.30	.38	.47	.56
1.4	.22	.31	.40	.49	.58
1.5	.24	.33	.42	.51	.59
1.6	.26	.34	.43	.52	.61
1.7	.27	.36	.45	.54	.63
1.8	.29	.38	.46	.55	.64
1.9	.30	.39	.48	.57	.66

Table 67

Predicting Weight (Kilograms) of Girls, Age Eleven Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																						
	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4
83	17.32	17.79	18.25	18.72	19.19	19.66	20.12	20.59	21.06	21.53	21.99	22.46	22.93	23.39	23.86	24.33	24.80	25.26	25.73	26.20	26.67	27.13	27.60
82	16.80	17.27	17.73	18.20	18.67	19.13	19.60	20.07	20.54	21.00	21.41	21.94	22.41	22.87	23.34	23.81	24.28	24.74	25.21	25.68	26.14	26.61	27.08
81	16.28	16.74	17.21	17.68	18.15	18.61	19.08	19.55	20.01	20.48	20.95	21.42	21.88	22.35	22.82	23.29	23.75	24.22	24.69	25.16	25.62	26.09	26.56
80	15.75	16.22	16.69	17.16	17.62	18.09	18.56	19.03	19.49	19.96	20.43	20.90	21.36	21.83	22.30	22.76	23.23	23.70	24.17	24.63	25.10	25.57	26.04
79	15.23	15.70	16.17	16.63	17.10	17.57	18.04	18.50	18.97	19.44	19.91	20.37	20.84	21.31	21.78	22.24	22.71	23.18	23.64	24.11	24.58	25.05	25.51
78	14.71	15.18	15.65	16.11	16.58	17.05	17.52	17.98	18.45	18.92	19.38	19.85	20.32	20.79	21.25	21.72	22.19	22.66	23.12	23.59	24.06	24.52	24.99
77	14.19	14.66	15.12	15.59	16.06	16.53	16.99	17.46	17.93	18.40	18.86	19.33	19.80	20.26	20.73	21.20	21.67	22.13	22.60	23.07	23.54	24.00	24.47
76	13.67	14.14	14.60	15.07	15.54	16.00	16.47	16.94	17.41	17.87	18.34	18.81	19.28	19.74	20.21	20.68	21.14	21.61	22.08	22.55	23.01	23.48	23.95
75	13.15	13.61	14.08	14.55	15.02	15.48	15.95	16.42	16.88	17.35	17.82	18.29	18.75	19.22	19.69	20.16	20.62	21.09	21.56	22.03	22.49	22.96	23.43
74	12.62	13.09	13.56	14.03	14.49	14.96	15.43	15.90	16.36	16.83	17.30	17.76	18.23	18.70	19.17	19.63	20.10	20.57	21.04	21.50	21.97	22.44	22.91
73	12.10	12.57	13.04	13.50	13.97	14.40	14.91	15.37	15.84	16.31	16.78	17.24	17.71	18.18	18.65	19.11	19.58	20.05	20.51	20.98	21.45	21.92	22.38
72	11.58	12.05	12.52	12.98	13.45	13.92	14.38	14.85	15.32	15.79	16.25	16.72	17.19	17.66	18.12	18.59	19.06	19.53	19.99	20.46	20.93	21.39	21.86
71	11.06	11.53	11.99	12.46	12.93	13.40	13.86	14.33	14.80	15.27	15.73	16.20	16.67	17.13	17.60	18.07	18.54	19.00	19.47	19.94	20.41	20.87	21.34
70	10.54	11.00	11.47	11.94	12.41	12.87	13.34	13.81	14.28	14.74	15.21	15.68	16.15	16.61	17.08	17.55	18.01	18.48	18.95	19.42	19.89	20.35	20.82
69	10.02	10.48	10.95	11.42	11.89	12 35	12.82	13.29	13.75	14.22	14.69	15.16	15.62	16.09	16.56	17.03	17.49	17.96	18.43	18.89	19.36	19.83	20.30
68	9.49	9.96	10.43	10.90	11.36	11.83	12.30	12.77	13.23	13.70	14.17	14.63	15.10	15.57	16.04	16.50	16.97	17.44	17.91	18.37	18.84	19.31	19.78
67	8.97	9.44	9.91	10.37	10.84	11.31	11.78	12.24	12.71	13.18	13.65	14.11	14.58	15.05	15.51	15.98	16.45	16.92	17.38	17.85	18.32	10.79	19.25
66	8.45	8.92	9.39	9.85	10.32	10.79	11.25	11.72	12.19	12.66	13.12	13.59	14.06	14.53	14.99	15.46	15.93	16.40	16.86	17.33	17.80	18.26	18.73
65	7.93	8.40	8.86	9.33	9.80	10.27	10.73	11.20	11.67	12.13	12.60	13.07	13.54	14.00	14.47	14.94	15.41	15.87	16.34	16.81	17.28	17.74	18.21
64	7.41	7.87	8.34	8.81	9.28	9.74	10.21	10.68	11.15	11.61	12.08	12.55	13.02	13.48	13.95	14.42	14.88	15.35	15.82	16.29	16.75	17.22	17.69
63	6.89	7.35	7.82	8.29	8.75	9.22	9.69	10.16	10.62	11.09	11.56	12.03	12.49	12.96	13.43	13.90	14.36	14.83	15.30	15.76	16.23	16.70	17.17
62	6.36	6.83	7.30	7.77	8.23	8.70	9.17	9.64	10.10	10.57	11.04	11.50	11.97	12.44	12.91	13.37	13.34	14.31	14.78	15.24	15.71	16.18	16.65
61	5.84	6.31	6.78	7.24	7.71	8.18	8.65	9.11	9.58	10.05	10.52	10.98	11.45	11.92	12.38	12.85	13.32	13.79	14.25	14.72	15.19	15.66	16.12
60	5.32	5.79	6.26	6.72	7.19	7.66	8.12	8.59	9.06	9.53	9.99	10.46	10.93	11.40	11.86	12.33	12.80	13.27	13.73	14.20	14.67	15.13	15.60
59	4.80	5.27	5.73	6.20	6.67	7.14	7.60	8.07	8.54	9.00	9.47	9.94	10.41	10.87	11.34	11.81	12.28	12.74	13.21	13.68	14.15	14.61	15.08
58	4.28	4.74	5.21	5.65	6.15	6.61	7.08	7.55	8.02	8.48	8.95	9.42	9.89	10.35	10.82	11.29	11.75	12.22	12.69	13.16	13.62	14.09	14.56
57	3.76	4.22	4.69	5.16	5.62	6.09	6.56	7.03	7.49	7.96	8.43	8.90	9.36	9.83	10.30	10.77	11.23	11.70	12.17	12.63	13.10	13.57	14.04
56	3.23	3.70	4.17	4.64	5.10	5.57	6.04	6.51	6.97	7.44	7.91	8.37	8.84	9.31	9.78	10.24	10.71	11.18	11.65	12.11	12.58	13.05	13.51
55	2.71	3.18	3.65	4.11	4.58	5.05	5.52	5.98	6.45	6.92	7.38	7.85	8.32	8.79	9.25	9.72	10.19	10.66	11.12	11.59	12.06	12.53	12.99
54	2.19	2.66	3.13	3.59	4.06	4.53	5.00	5.46	5.93	6.40	6.86	7.33	7.80	8.27	8.73	9.20	9.67	10.14	10.60	11.07	11.54	12.01	12.47
53	1.67	2.14	2.60	3.07	3.54	4.01	4.47	4.94	5.41	5.88	6.34	6.81	7.28	7.74	8.21	8.69	9.15	9.61	10.08	10.55	11.02	11.48	11.95
52	1.15	1.62	2.08	2.55	3.02	3.48	3.95	4.42	4.89	5.35	5.82	6.29	6.76	7.22	7.69	8.16	8.63	9.09	9.56	10.03	10.49	10.96	11.43
51	.63	1.09	1.56	2.03	2.50	2.96	3.43	3.90	4.36	4.83	5.30	5.77	6.23	6.70	7.17	7.64	8.10	8.57	9.04	9.51	9.97	10.44	10.91

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.234
.1	.052	.286
.2	.104	.338
.3	.157	.390
.4	.209	.442
.5	.261	.495
.6	.313	.547
.7	.365	.599
.8	.417	.651
.9	.470	.703

Table 68

Predicting Weight (Kilograms) of Girls, Age Twelve Years, From Height, Hips,
Chest Circumference and Knee (Centimeters) (Weight = .1234 height
+ 1.0364 hips + .6959 chest circumference + 3.3690
knee - 78.2565; R = .9289)

Height, Centimeters	Hip Width, Centimeters																									
	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5
176	23.15	23.67	24.19	24.71	25.23	25.74	26.26	26.78	27.30	27.82	28.34	28.85	29.37	29.89	30.41	30.93	31.44	31.96	32.48	33.00	33.52	34.04	34.55	35.07	35.59	36.11
174	22.91	23.42	23.94	24.46	24.98	25.50	26.02	26.53	27.05	27.57	28.09	28.61	29.13	29.64	30.16	30.68	31.20	31.72	32.23	32.75	33.27	33.79	34.31	34.83	35.34	35.86
172	22.66	23.18	23.70	24.21	24.73	25.25	25.77	26.29	26.81	27.32	27.84	28.36	28.88	29.40	29.91	30.43	30.95	31.47	31.99	32.51	33.02	33.54	34.06	34.58	35.10	35.61
170	22.41	22.93	23.45	23.97	24.49	25.00	25.52	26.04	26.56	27.08	27.60	28.11	28.63	29.15	29.67	30.19	30.70	31.22	31.74	32.26	32.78	33.30	33.81	34.33	34.85	35.37
168	22.17	22.68	23.20	23.72	24.24	24.76	25.29	25.79	26.31	26.83	27.35	27.87	28.38	28.90	29.42	29.94	30.46	30.98	31.49	32.01	32.53	33.05	33.57	34.08	34.60	35.12
166	21.92	22.44	22.96	23.47	23.99	24.51	25.03	25.55	26.07	26.58	27.10	27.62	28.14	28.66	29.17	29.69	30.21	30.73	31.25	31.77	32.28	32.80	33.32	33.84	34.36	34.87
164	21.67	22.19	22.71	23.23	23.75	24.26	24.79	25.30	25.82	26.34	26.85	27.37	27.89	28.41	28.93	29.45	29.96	30.48	31.00	31.52	32.04	32.55	33.07	33.59	34.11	34.63
162	21.43	21.94	22.46	22.98	23.50	24.02	24.54	25.05	25.57	26.09	26.61	27.13	27.64	28.16	28.68	29.20	29.72	30.24	30.75	31.27	31.79	32.31	32.83	33.34	33.86	34.38
160	21.18	21.70	22.22	22.73	23.25	23.77	24.29	24.81	25.32	25.84	26.36	26.88	27.40	27.92	28.43	28.95	29.47	29.99	30.51	31.02	31.54	32.06	32.58	33.10	33.62	34.13
158	20.93	21.45	21.97	22.49	23.01	23.52	24.04	24.56	25.08	25.60	26.11	26.63	27.15	27.67	28.19	28.71	29.22	29.74	30.26	30.78	31.30	31.81	32.33	32.85	33.37	33.89
156	20.69	21.20	21.72	22.24	22.76	23.28	23.79	24.31	24.83	25.35	25.87	26.39	26.90	27.42	27.94	28.46	28.98	29.49	30.01	30.53	31.05	31.57	32.09	32.60	33.12	33.64
154	20.44	20.96	21.48	21.99	22.51	23.03	23.55	24.07	24.58	25.10	25.62	26.14	26.66	27.18	27,69	28.21	28.73	29.25	29.77	30.28	30.80	31.32	31.84	32.36	32.88	33.39
152	20.19	20.71	21.23	21.75	22.26	22.78	23.30	23.82	24.34	24.86	25.37	25.89	26.41	26.93	27.45	27.96	28.48	29.00	29.52	30.04	30.56	31.07	31.59	32.11	32.63	33.15
150	19.95	20.46	20.98	21.50	22.02	22.54	23.05	23.57	24.09	24.61	25.13	25.65	26.16	26.68	27.20	27.72	28.24	28.75	29.27	29.79	30.31	30.83	31.35	31.86	32.38	32.90
148	19.70	20.22	20.73	21.25	21.77	22.29	22.81	23.33	23.84	24.36	24.88	25.40	25.92	26.43	26.95	27.47	27.99	28.51	29.03	29.54	30.06	30.58	31.10	31.62	32.14	32.65
146	19.45	19.97	20.49	21.01	21.52	22.04	22.56	23.08	23.60	24.12	24.63	25.15	25.67	26.19	26.71	27.22	27.74	28.26	28.78	29.30	29.82	30.33	30.85	31.37	31.89	32.41
144	19.20	19.72	20.24	20.76	21.28	21.80	22.31	22.83	23.35	23.87	24.39	24.90	25.42	25.94	26.46	26.98	27.50	28.01	28.53	29.05	29.57	30.09	30.61	31.12	31.64	32.16
142	18.96	19.48	19.99	20.51	21.03	21.55	22.07	22.59	23.10	23.62	24.14	24.66	25.18	25.69	26.21	26.73	27.25	27.77	28.29	28.80	29.32	29.84	30.36	30.88	31.39	31.91
140	18.71	19.23	19.75	20.27	20.78	21.30	21.82	22.34	22.86	23.37	23.89	24.41	24.93	25.45	25.97	26.48	27.00	27.52	28.04	28.56	29.08	29.59	30.11	30.63	31.15	31.67
138	18.46	18.98	19.50	20.02	20.54	21.06	21.57	22.09	22.61	23.13	23.65	24.16	24.68	25.20	25.72	26.24	26.76	27.27	27.79	28.31	28.83	29.35	29.86	30.38	30.90	31.42
136	18.22	18.74	19.25	19.77	20.29	20.81	21.33	21.84	22.36	22.88	23.40	23.92	24.44	24.95	25.47	25.99	26.51	27.03	27.55	28.06	28.58	29.10	29.62	30.14	30.65	31.17
134	17.97	18.49	19.01	19.53	20.04	20.56	21.08	21.60	22.12	22.63	23.15	23.67	24.19	24.71	25.23	25.74	26.26	26.78	27.30	27.82	28.33	28.85	29.37	29.89	30.41	30.93
132	17.72	18.24	18.76	19.28	19.80	20.31	20.83	21.35	21.87	22.39	22.91	23.42	23.94	24.46	24.98	25.50	26.02	26.53	27.05	27.57	28.09	28.61	29.12	29.64	30.16	30.68
130	17.48	18.00	18.51	19.03	19.55	20.07	20.59	21.10	21.63	22.14	22.66	23.18	23.70	24.21	24.73	25.25	25.77	26.29	26.80	27.32	27.84	28.36	28.88	29.40	29.91	30.43

Interpolation Table

Height	Hips				
	0	1	.2	.3	.4
0	0	.01	.02	.03	.04
.1	.01	.02	.03	.04	.05
.2	.02	.04	.05	.06	.07
.3	.04	.05	.06	.07	.08
.4	.05	.06	.07	.08	.09
.5	.06	.07	.08	.09	.10
.6	.07	.08	.09	.10	.12
.7	.09	.10	.11	.12	.13
.8	.10	.11	.12	.13	.14
.9	.11	.12	.13	.14	.15
1.0	.12	.13	.14	.15	.16
1.1	.14	.15	.16	.17	.18
1.2	.15	.16	.17	.18	.19
1.3	.16	.17	.18	.19	.20
1.4	.17	.18	.19	.20	.21
1.5	.18	.19	.21	.22	.23
1.6	.20	.21	.22	.23	.24
1.7	.21	.22	.23	.24	.25
1.8	.22	.23	.24	.25	.26
1.9	.23	.24	.25	.26	.28

Table 69

Predicting Weight (Kilograms) of Girls, Age Twelve Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																					
	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6
85	20.71	21.39	22.06	22.73	23.41	24.08	24.76	25.43	26.10	26.78	27.45	28.12	28.80	29.47	30.15	30.82	31.49	32.17	32.84	33.52	34.19	34.86
84	20.02	20.69	21.36	22.04	22.71	23.39	24.06	24.73	25.41	26.08	26.76	27.43	28.10	28.78	29.45	30.12	30.80	31.47	32.15	32.82	33.49	34.17
83	19.32	20.00	20.67	21.34	22.02	22.69	23.36	24.04	24.71	25.39	26.06	26.73	27.41	28.08	28.75	29.43	30.10	30.78	31.45	32.12	32.80	33.47
82	18.63	19.30	19.97	20.65	21.32	21.99	22.67	23.34	24.02	24.69	25.36	26.04	26.71	27.38	28.06	28.73	29.41	30.08	30.75	31.43	32.10	32.78
81	17.93	18.60	19.28	19.95	20.62	21.30	21.97	22.65	23.32	23.99	24.67	25.34	26.02	26.69	27.36	28.04	28.71	29.38	30.06	30.73	31.41	32.08
80	17.23	17.91	18.58	19.26	19.93	20.60	21.28	21.95	22.62	23.30	23.97	24.65	25.32	25.99	26.67	27.34	28.01	28.69	29.36	30.04	30.71	31.38
79	16.54	17.21	17.89	18.56	19.23	19.91	20.58	21.25	21.93	22.60	23.28	23.95	24.62	25.30	25.97	26.64	27.32	27.99	28.67	29.34	30.01	30.69
78	15.84	16.52	17.19	17.86	18.54	19.21	19.88	20.56	21.23	21.91	22.58	23.25	23.93	24.60	25.28	25.95	26.62	27.30	27.97	28.64	29.32	29.99
77	15.15	15.82	16.49	17.17	17.84	18.51	19.19	19.86	20.54	21.21	21.88	22.56	23.23	23.91	24.58	25.25	25.93	26.60	27.27	27.95	28.62	29.30
76	14.45	15.12	15.80	16.47	17.15	17.82	18.49	19.17	19.84	20.51	21.19	21.86	22.54	23.21	23.88	24.56	25.23	25.90	26.58	27.25	27.93	28.60
75	13.75	14.43	15.10	15.78	16.45	17.12	17.80	18.47	19.14	19.82	20.49	21.17	21.84	22.51	23.19	23.86	24.53	25.21	25.88	26.56	27.23	27.90
74	13.06	13.73	14.41	15.08	15.75	16.43	17.10	17.77	18.45	19.12	19.80	20.47	21.14	21.82	22.49	23.17	23.84	24.51	25.19	25.86	26.53	27.21
73	12.36	13.04	13.71	14.38	15.06	15.73	16.41	17.08	17.75	18.43	19.10	19.77	20.45	21.12	21.80	22.47	23.14	23.82	24.49	25.16	25.84	26.51
72	11.67	12.34	13.01	13.69	14.36	15.04	15.71	16.38	17.06	17.73	18.40	19.08	19.75	20.43	21.10	21.77	22.45	23.12	23.79	24.47	25.14	25.82
71	10.97	11.64	12.32	12.99	13.67	14.34	15.01	15.69	16.36	17.03	17.74	18.38	19.06	19.73	20.40	21.08	21.75	22.43	23.10	23.77	24.45	25.12
70	10.27	10.95	11.62	12.30	12.97	13.64	14.32	14.99	15.67	16.34	17.01	17.69	18.36	19.03	19.71	20.38	21.06	21.73	22.40	23.08	23.75	24.42
69	9.58	10.25	10.93	11.60	12.27	12.95	13.62	14.30	14.97	15.64	16.32	16.99	17.66	18.34	19.01	19.69	20.36	21.03	21.71	22.38	23.05	23.73
68	8.88	9.56	10.23	10.90	11.58	12.25	12.93	13.60	14.27	14.95	15.62	16.29	16.97	17.64	18.32	18.99	19.66	20.34	21.01	21.69	22.36	23.03
67	8.19	8.86	9.53	10.21	10.88	11.56	12.23	12.90	13.58	14.25	14.92	15.60	16.27	16.95	17.62	18.29	18.97	19.64	20.32	20.99	21.66	22.34
66	7.49	8.16	8.84	9.51	10.19	10.86	11.53	12.21	12.88	13.56	14.23	14.90	15.58	16.25	16.92	17.60	18.27	18.95	19.62	20.29	20.97	21.64
65	6.80	7.47	8.14	8.92	9.49	10.16	10.84	11.51	12.19	12.86	13.53	14.21	14.88	15.55	16.23	16.90	17.58	18.25	18.92	19.60	20.27	20.94
64	6.10	6.77	7.45	8.12	8.79	9.47	10.14	10.82	11.49	12.16	12.84	13.51	14.18	14.86	15.53	16.21	16.88	17.55	18.23	18.90	19.58	20.25
63	5.40	6.08	6.75	7.42	8.10	8.77	9.45	10.12	10.79	11.47	12.14	12.82	13.49	14.16	14.84	15.51	16.18	16.86	17.53	18.21	18.88	19.55
62	4.71	5.38	6.06	6.73	7.40	8.08	8.75	9.42	10.10	10.77	11.45	12.12	12.79	13.47	14.14	14.81	15.49	16.16	16.84	17.51	18.18	18.86
61	4.01	4.69	5.36	6.03	6.71	7.38	8.05	8.73	9.40	10.08	10.75	11.42	12.10	12.78	13.44	14.12	14.79	15.47	16.14	16.81	17.49	18.16
60	3.32	3.99	4.66	5.34	6.01	6.68	7.36	8.03	8.71	9.38	10.05	10.73	11.40	12.08	12.75	13.42	14.10	14.77	15.44	16.12	16.79	17.47
59	2.62	3.29	3.97	4.64	5.31	5.99	6.66	7.34	8.01	8.68	9.36	10.03	10.71	11.38	12.05	12.73	13.40	14.07	14.75	15.42	16.10	16.77
58	1.92	2.60	3.27	3.95	4.62	5.29	5.97	6.64	7.31	7.99	8.66	9.34	10.01	10.68	11.36	12.03	12.70	13.38	14.05	14.73	15.40	16.07
57	1.23	1.90	2.58	3.25	3.92	4.60	5.27	5.94	6.62	7.29	7.97	8.64	9.31	9.99	10.66	11.33	12.01	12.68	13.36	14.03	14.70	15.38
56	0.53	1.21	1.88	2.55	3.23	3.90	4.57	5.25	5.92	6.60	7.27	7.94	8.62	9.29	9.97	10.64	11.31	11.99	12.66	13.33	14.01	14.68
55	-0.16	0.51	1.18	1.86	2.53	3.21	3.88	4.55	5.23	5.90	6.57	7.25	7.92	8.60	9.27	9.94	10.62	11.29	11.96	12.64	13.31	13.99
54	-0.86	-0.19	0.49	1.16	1.84	2.51	3.18	3.86	4.53	5.20	5.88	6.55	7.23	7.90	8.57	9.25	9.92	10.59	11.27	11.94	12.62	13.29
53	-1.56	-0.88	-0.21	0.47	1.14	1.81	2.49	3.16	3.83	4.51	5.18	5.86	6.53	7.20	7.88	8.55	9.23	9.90	10.57	11.25	11.92	12.59
52	-2.25	-1.58	-0.90	-0.23	0.44	1.12	1.79	2.47	3.14	3.81	4.49	5.16	5.83	6.51	7.18	7.86	8.53	9.20	9.88	10.55	11.22	11.90

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.337
.1	.070	.406
.2	.139	.476
.3	.209	.546
.4	.278	.615
.5	.348	.685
.6	.418	.754
.7	.487	.824
.8	.557	.894
.9	.626	.963

Table 70

Predicting Weight (Kilograms) of Girls, Age Thirteen Years, From Height, Hips,
Chest Circumference and Knee (Centimeters) (Weight = .1337 height
+ 1.4422 hips + .4933 chest circumference + 4.3232
knee - 83.9531; R = .9279)

Height, Centimeters	Hip Width, Centimeters																								
	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5	32.0
178	8.69	9.41	10.13	10.85	11.57	12.30	13.02	13.74	14.46	15.18	15.90	16.62	17.34	18.06	18.78	19.51	20.23	20.95	21.67	22.39	23.11	23.83	24.55	25.27	26.00
176	8.42	9.14	9.86	10.59	11.31	12.03	12.75	13.47	14.19	14.91	15.63	16.35	17.08	17.80	18.52	19.24	19.96	20.68	21.40	22.12	22.84	23.57	24.29	25.01	25.73
174	8.15	8.88	9.60	10.32	11.04	11.76	12.48	13.20	13.92	14.64	15.37	16.09	16.81	17.53	18.25	18.97	19.69	20.41	21.13	21.86	22.58	23.30	24.02	24.74	25.46
172	7.89	8.61	9.33	10.05	10.77	11.49	12.21	12.94	13.66	14.38	15.10	15.82	16.54	17.26	17.98	18.70	19.42	20.15	20.87	21.59	22.31	23.03	23.75	24.47	25.19
170	7.62	8.34	9.06	9.78	10.50	11.23	11.95	12.67	13.39	14.11	14.83	15.55	16.27	16.99	17.72	18.44	19.16	19.88	20.60	21.32	22.04	22.76	23.48	24.21	24.93
168	7.35	8.07	8.79	9.52	10.24	10.96	11.68	12.40	13.12	13.84	14.56	15.28	16.01	16.73	17.45	18.17	18.89	19.61	20.33	21.05	21.77	22.50	23.22	23.94	24.66
166	7.09	7.81	8.53	9.25	9.97	10.69	11.41	12.13	12.85	13.58	14.30	15.02	15.74	16.46	17.18	17.90	18.62	19.34	20.06	20.79	21.51	22.23	22.95	23.67	24.39
164	6.82	7.54	8.26	8.98	9.70	10.42	11.14	11.87	12.59	13.31	14.03	14.75	15.47	16.19	16.91	17.63	18.36	19.08	19.80	20.52	21.24	21.96	22.68	23.40	24.12
162	6.55	7.27	7.99	8.71	9.43	10.16	10.88	11.60	12.32	13.04	13.76	14.48	15.20	15.92	16.65	17.37	18.09	18.81	19.53	20.25	20.97	21.69	22.41	23.14	23.86
160	6.28	7.00	7.73	8.45	9.17	9.89	10.61	11.33	12.05	12.77	13.49	14.22	14.94	15.66	16.38	17.10	17.82	18.54	19.26	19.98	20.70	21.43	22.15	22.87	23.59
158	6.02	6.74	7.46	8.18	8.90	9.62	10.34	11.06	11.78	12.51	13.23	13.95	14.67	15.39	16.11	16.83	17.55	18.27	19.00	19.72	20.44	21.16	21.88	22.60	23.32
156	5.75	6.47	7.19	7.91	8.63	9.35	10.07	10.80	11.52	12.24	12.96	13.68	14.40	15.12	15.84	16.56	17.29	18.01	18.73	19.45	20.17	20.89	21.61	22.33	23.05
154	5.48	6.20	6.92	7.64	8.37	9.09	9.81	10.53	11.25	11.97	12.69	13.41	14.13	14.86	15.58	16.30	17.02	17.74	18.46	19.18	19.90	20.62	21.34	22.07	22.79
152	5.21	5.93	6.66	7.38	8.10	8.82	9.54	10.26	10.98	11.70	12.42	13.15	13.87	14.59	15.31	16.03	16.75	17.47	18.19	18.91	19.64	20.36	21.08	21.80	22.52
150	4.95	5.67	6.39	7.11	7.83	8.55	9.27	9.99	10.71	11.44	12.16	12.88	13.60	14.32	15.04	15.76	16.48	17.20	17.93	18.65	19.37	20.09	20.81	21.53	22.25
148	4.68	5.40	6.12	6.84	7.56	8.28	9.01	9.73	10.45	11.17	11.89	12.61	13.33	14.05	14.77	15.50	16.22	16.94	17.66	18.38	19.10	19.82	20.54	21.26	21.98
146	4.41	5.13	5.85	6.57	7.30	8.02	8.74	9.46	10.18	10.90	11.62	12.34	13.06	13.79	14.51	15.23	15.95	16.67	17.39	18.11	18.83	19.55	20.28	21.00	21.72
144	4.14	4.86	5.59	6.31	7.03	7.75	8.47	9.19	9.91	10.63	11.35	12.08	12.80	13.52	14.24	14.96	15.68	16.40	17.12	17.84	18.57	19.29	20.01	20.73	21.45
142	3.88	4.60	5.32	6.04	6.76	7.48	8.20	8.92	9.65	10.37	11.09	11.81	12.53	13.25	13.97	14.69	15.41	16.14	16.86	17.58	18.30	19.02	19.74	20.46	21.18
140	3.61	4.33	5.05	5.77	6.49	7.21	7.94	8.66	9.38	10.10	10.82	11.54	12.26	12.98	13.70	14.43	15.15	15.87	16.59	17.31	18.03	18.75	19.47	20.19	20.92
138	3.34	4.06	4.78	5.50	6.23	6.95	7.67	8.39	9.11	9.83	10.55	11.27	11.99	12.72	13.44	14.16	14.88	15.60	16.32	17.04	17.76	18.48	19.21	19.93	20.65
136	3.07	3.80	4.52	5.24	5.96	6.68	7.40	8.12	8.84	9.56	10.29	11.01	11.73	12.45	13.17	13.89	14.61	15.33	16.05	16.78	17.50	18.22	18.94	19.66	20.38
134	2.81	3.53	4.25	4.97	5.69	6.41	7.13	7.85	8.58	9.30	10.02	10.74	11.46	12.18	12.90	13.62	14.34	15.07	15.79	16.51	17.23	17.95	18.67	19.39	20.11
132	2.54	3.26	3.98	4.70	5.42	6.14	6.87	7.59	8.31	9.03	9.75	10.47	11.19	11.91	12.63	13.36	14.09	14.80	15.52	16.24	16.96	17.68	18.40	19.12	19.85
130	2.27	2.99	3.71	4.44	5.16	5.88	6.60	7.32	8.04	8.76	9.48	10.20	10.93	11.65	12.37	13.09	13.81	14.53	15.25	15.97	16.69	17.42	18.14	18.86	19.59

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.14	.29	.43	.58
.1	.01	.16	.30	.45	.59
.2	.03	.17	.32	.46	.60
.3	.04	.18	.33	.47	.62
.4	.05	.20	.34	.49	.63
.5	.07	.21	.36	.50	.64
.6	.08	.22	.37	.51	.66
.7	.09	.24	.38	.53	.67
.8	.11	.25	.40	.54	.68
.9	.12	.26	.41	.55	.70
1.0	.13	.28	.42	.57	.71
1.1	.15	.29	.44	.58	.72
1.2	.16	.31	.45	.59	.74
1.3	.17	.32	.46	.61	.75
1.4	.19	.33	.48	.62	.76
1.5	.20	.35	.49	.63	.78
1.6	.21	.36	.50	.65	.79
1.7	.23	.37	.52	.66	.80
1.8	.24	.39	.53	.57	.92
1.9	.25	.40	.54	.69	.83

Table 71

Predicting Weight (Kilograms) of Girls, Age Thirteen Years, From Height, Hips
Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																						
	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6
88.5	34.78	35.65	36.51	37.38	38.24	39.11	39.97	40.84	41.70	42.57	43.43	44.30	45.16	46.02	46.89	47.75	48.62	49.48	50.35	51.21	52.08	52.94	53.81
87.0	34.04	34.91	35.77	36.64	37.50	38.37	39.23	40.10	40.96	41.83	42.69	43.56	44.42	45.28	46.15	47.01	47.88	48.74	49.61	50.47	51.34	52.20	53.07
85.5	33.30	34.17	35.03	35.90	36.76	37.63	38.49	39.36	40.22	41.09	41.95	42.82	43.68	44.54	45.41	46.27	47.14	48.00	48.87	49.73	50.60	51.46	52.33
84.0	32.56	33.43	34.29	35.16	36.02	36.89	37.75	38.62	39.48	40.35	41.21	42.08	42.94	43.80	44.67	45.53	46.40	47.26	48.13	48.99	49.86	50.72	51.59
82.5	31.82	32.69	33.55	34.42	35.28	36.15	37.01	37.88	38.74	39.61	40.47	41.34	42.20	43.06	43.93	44.79	45.66	46.52	47.39	48.25	49.12	49.98	50.85
81.0	31.08	31.95	32.81	33.68	34.54	35.41	36.27	37.14	38.00	38.87	39.73	40.60	41.46	42.32	43.19	44.05	44.92	45.78	46.65	47.51	48.38	49.24	50.11
79.5	30.34	31.21	32.07	32.94	33.80	34.67	35.53	36.40	37.26	38.13	38.99	39.86	40.72	41.58	42.54	43.31	44.18	45.04	45.91	46.74	47.64	48.50	49.37
78.0	29.60	30.47	31.33	32.20	33.06	33.93	34.79	35.66	36.52	37.39	38.25	39.12	39.98	40.84	41.71	42.57	43.44	44.30	45.17	46.03	46.90	47.76	48.63
76.5	28.86	29.73	30.59	31.46	32.32	33.19	34.05	34.92	35.78	36.65	37.51	38.38	39.24	40.10	40.97	41.83	42.70	43.56	44.43	45.29	46.16	47.02	47.89
75.0	28.12	28.99	29.85	30.72	31.58	32.45	33.31	34.18	35.04	35.91	36.77	37.64	38.50	39.36	40.23	41.09	41.96	42.82	43.69	44.55	45.42	46.28	47.15
73.5	27.38	28.25	29.11	29.98	30.84	31.71	32.57	33.44	34.30	35.17	36.03	36.90	37.76	38.62	39.49	40.35	41.22	42.08	42.95	43.81	44.68	45.54	46.41
72.0	26.64	27.51	28.37	29.24	30.10	30.97	31.83	32.70	33.56	34.43	35.29	36.16	37.02	37.88	38.75	39.61	40.48	41.34	42.21	43.07	43.94	44.80	45.67
70.5	25.90	26.77	27.63	28.50	29.36	30.23	31.09	31.96	32.82	33.69	34.55	35.42	36.28	37.15	38.01	38.87	39.74	40.60	41.47	42.33	43.20	44.06	44.93
69.0	25.16	26.03	26.89	27.76	28.62	29.49	30.35	31.22	32.08	32.95	33.81	34.68	35.54	36.41	37.27	38.14	39.00	39.86	40.73	41.59	42.46	43.32	44.19
67.5	24.42	25.29	26.15	27.02	27.88	28.75	29.61	30.48	31.34	32.21	33.07	33.94	34.80	35.67	36.53	37.39	38.26	39.12	39.99	40.85	41.72	42.58	43.45
66.0	23.68	24.55	25.41	26.28	27.14	28.01	28.87	29.74	30.60	31.47	32.33	33.20	34.06	34.93	35.79	36.65	37.52	38.38	39.25	40.11	40.98	41.84	42.71
64.5	22.94	23.81	24.67	25.54	26.40	27.27	28.13	29.00	29.86	30.73	31.59	32.46	33.32	34.19	35.05	35.91	36.78	37.64	38.51	39.37	40.24	41.10	41.97
63.0	22.20	23.07	23.93	24.80	25.66	26.53	27.39	28.26	29.12	29.99	30.85	31.72	32.58	33.45	34.31	35.17	36.04	36.90	37.77	38.63	39.50	40.36	41.23
61.5	21.46	22.33	23.19	24.06	24.92	25.79	26.65	27.52	28.38	29.25	30.11	30.98	31.84	32.71	33.57	34.43	35.30	36.16	37.03	37.89	38.76	39.62	40.49
60.0	20.73	21.59	22.45	23.32	24.18	25.05	25.91	26.78	27.64	28.51	29.37	30.24	31.10	31.97	32.83	33.69	34.56	35.42	36.29	37.15	38.02	38.88	39.75
58.5	19.99	20.85	21.71	22.58	23.44	24.31	25.17	26.04	26.90	27.77	28.63	29.50	30.36	31.23	32.09	32.95	33.82	34.68	35.55	36.41	37.28	38.14	39.01
57.0	19.25	20.11	20.97	21.84	22.70	23.57	24.43	25.30	26.16	27.03	27.89	28.76	29.62	30.49	31.35	32.21	33.08	33.94	34.81	35.67	36.54	37.40	38.27
55.5	18.51	19.37	20.23	21.10	21.96	22.83	23.69	24.56	25.42	26.29	27.15	28.02	28.88	29.75	30.61	31.47	32.34	33.20	34.07	34.93	35.80	36.66	37.53
54.0	17.77	18.63	19.49	20.36	21.22	22.09	22.95	23.82	24.68	25.55	26.41	27.28	28.14	29.01	29.87	30.73	31.60	32.46	33.33	34.19	35.06	35.92	36.79
52.5	17.03	17.89	18.75	19.62	20.48	21.35	22.21	23.08	23.94	24.81	25.67	26.54	27.40	28.27	29.13	29.99	30.86	31.72	32.59	33.45	34.32	35.18	36.05

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.432
.1	.049	.482
.2	.099	.531
.3	.148	.580
.4	.197	.630
.5	.247	.679
.6	.296	.728
.7	.345	.778
.8	.395	.827
.9	.444	.876
1.0	.493	.926
1.1	.543	.975
1.2	.592	1.024
1.3	.641	1.074
1.4	.691	1.123

Table 72

Predicting Weight (Kilograms) of Girls, Age Fourteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																								
	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5	32.0	32.5	33.0	33.5
177	7.52	7.94	8.36	8.78	9.20	9.62	10.04	10.46	10.89	11.31	11.73	12.15	12.57	12.99	13.41	13.83	14.25	14.68	15.10	15.52	15.94	16.36	16.78	17.20	17.62
176	7.30	7.72	8.14	8.56	8.98	9.40	9.83	10.25	10.67	11.09	11.51	11.93	12.35	12.77	13.19	13.62	14.04	14.46	14.88	15.30	15.72	16.14	16.56	16.98	17.41
175	7.08	7.50	7.92	8.35	8.77	9.19	9.61	10.03	10.45	10.87	11.29	11.71	12.14	12.56	12.98	13.40	13.82	14.24	14.66	15.08	15.50	15.93	16.35	16.77	17.19
174	6.87	7.29	7.71	8.13	8.55	8.97	9.39	9.81	10.23	10.66	11.08	11.50	11.92	12.34	12.76	13.18	13.60	14.02	14.45	14.87	15.29	15.71	16.13	16.55	16.97
173	6.65	7.07	7.49	7.91	8.33	8.75	9.17	9.60	10.02	10.44	10.86	11.28	11.70	12.12	12.54	12.96	13.39	13.81	14.23	14.65	15.07	15.49	15.91	16.33	16.75
172	6.43	6.85	7.27	7.69	8.12	8.54	8.96	9.38	9.80	10.22	10.64	11.06	11.48	11.91	12.33	12.75	13.17	13.59	14.01	14.43	14.85	15.27	15.70	16.12	16.54
171	6.21	6.64	7.06	7.48	7.90	8.32	8.74	9.16	9.58	10.00	10.43	10.85	11.27	11.69	12.11	12.53	12.95	13.37	13.79	14.22	14.64	15.06	15.48	15.90	16.32
170	6.00	6.42	6.84	7.26	7.68	8.10	8.52	8.95	9.37	9.79	10.21	10.63	11.05	11.47	11.89	12.31	12.73	13.16	13.58	14.00	14.42	14.84	15.26	15.68	16.10
169	5.78	6.20	6.62	7.04	7.46	7.89	8.31	8.73	9.15	9.57	9.99	10.41	10.83	11.25	11.68	12.10	12.52	12.94	13.36	13.78	14.20	14.62	15.04	15.47	15.89
168	5.56	5.98	6.41	6.83	7.25	7.67	8.09	8.51	8.93	9.35	9.77	10.20	10.62	11.04	11.46	11.88	12.30	12.72	13.14	13.56	13.99	14.41	14.83	15.25	15.67
167	5.35	5.77	6.19	6.61	7.03	7.45	7.87	8.29	8.72	9.14	9.56	9.98	10.40	10.82	11.24	11.66	12.08	12.51	12.93	13.35	13.77	14.19	14.61	15.03	15.45
166	5.13	5.55	5.97	6.39	6.81	7.23	7.66	8.08	8.50	8.92	9.34	9.76	10.18	10.60	11.02	11.45	11.87	12.29	12.71	13.13	13.55	13.97	14.39	14.81	15.24
165	4.91	5.33	5.75	6.18	6.60	7.02	7.44	7.86	8.28	8.70	9.12	9.54	9.97	10.39	10.81	11.23	11.65	12.07	12.49	12.91	13.33	13.76	14.18	14.60	15.02
164	4.70	5.12	5.54	5.96	6.38	6.80	7.22	7.64	8.06	8.49	8.91	9.33	9.75	10.17	10.59	11.01	11.43	11.85	12.28	12.70	13.12	13.54	13.96	14.38	14.80
163	4.48	4.90	5.32	5.74	6.16	6.58	7.00	7.43	7.85	8.27	8.69	9.11	9.53	9.95	10.37	10.79	11.22	11.64	12.06	12.48	12.90	13.32	13.74	14.16	14.58
162	4.26	4.68	5.10	5.52	5.95	6.37	6.79	7.21	7.63	8.05	8.47	8.89	9.31	9.74	10.16	10.58	11.00	11.42	11.84	12.26	12.68	13.10	13.53	13.95	14.37
161	4.04	4.47	4.89	5.31	5.73	6.15	6.57	6.99	7.41	7.83	8.26	8.68	9.10	9.52	9.94	10.36	10.78	11.20	11.62	12.05	12.47	12.89	13.31	13.73	14.15
160	3.83	4.25	4.67	5.09	5.51	5.93	6.35	6.78	7.20	7.62	8.04	8.46	8.88	9.30	9.72	10.14	10.56	10.99	11.41	11.83	12.25	12.67	13.09	13.51	13.93
159	3.61	4.03	4.45	4.87	5.29	5.72	6.14	6.56	6.98	7.40	7.82	8.24	8.66	9.08	9.51	9.93	10.35	10.77	11.19	11.61	12.03	12.45	12.87	13.30	13.72
158	3.39	3.81	4.24	4.66	5.08	5.50	5.92	6.34	6.76	7.18	7.60	8.03	8.45	8.87	9.29	9.71	10.13	10.55	10.97	11.39	11.82	12.24	12.66	13.08	13.50
157	3.18	3.60	4.02	4.44	4.86	5.28	5.70	6.12	6.55	6.97	7.39	7.81	8.23	8.65	9.07	9.49	9.91	10.34	10.76	11.18	11.60	12.02	12.44	12.86	13.28
156	2.96	3.38	3.80	4.22	4.64	5.06	5.49	5.91	6.33	6.75	7.17	7.59	8.01	8.43	8.85	9.28	9.70	10.12	10.54	10.96	11.38	11.80	12.22	12.64	13.07
155	2.74	3.16	3.58	4.01	4.43	4.85	5.27	5.69	6.11	6.53	6.95	7.37	7.80	8.22	8.64	9.06	9.48	9.90	10.32	10.74	11.16	11.59	12.01	12.43	12.85
154	2.53	2.95	3.37	3.79	4.21	4.63	5.05	5.47	5.89	6.32	6.74	7.16	7.58	8.00	8.42	8.84	9.26	9.68	10.11	10.53	10.95	11.37	11.79	12.21	12.63
153	2.31	2.73	3.15	3.57	3.99	4.41	4.83	5.26	5.68	6.10	6.52	6.94	7.36	7.78	8.20	8.62	9.05	9.47	9.89	10.31	10.73	11.15	11.57	11.99	12.41
152	2.09	2.51	2.93	3.35	3.78	4.20	4.62	5.04	5.46	5.88	6.30	6.72	7.14	7.57	7.99	8.41	8.83	9.25	9.67	10.09	10.51	10.93	11.36	11.78	12.20
151	1.87	2.30	2.72	3.14	3.56	3.98	4.40	4.82	5.24	5.66	6.09	6.51	6.93	7.35	7.77	8.19	8.61	9.03	9.45	9.88	10.30	10.72	11.14	11.56	11.98
150	1.66	2.08	2.50	2.92	3.34	3.76	4.18	4.61	5.03	5.45	5.87	6.29	6.71	7.13	7.55	7.97	8.39	8.82	9.24	9.66	10.08	10.50	10.92	11.34	11.76
149	1.44	1.86	2.28	2.70	3.12	3.55	3.97	4.39	4.81	5.23	5.65	6.07	6.49	6.91	7.34	7.76	8.18	8.60	9.02	9.44	9.86	10.28	10.70	11.13	11.55
148	1.22	1.64	2.07	2.49	2.91	3.33	3.75	4.17	4.59	5.01	5.43	5.86	6.28	6.70	7.12	7.54	7.96	8.38	8.80	9.22	9.65	10.07	10.49	10.91	11.33
147	1.01	1.43	1.85	2.27	2.69	3.11	3.53	3.95	4.38	4.80	5.22	5.64	6.06	6.48	6.90	7.32	7.74	8.17	8.59	9.01	9.43	9.85	10.27	10.69	11.11
146	.79	1.21	1.63	2.05	2.47	2.89	3.32	3.74	4.16	4.58	5.00	5.42	5.84	6.26	6.68	7.11	7.53	7.95	8.37	8.79	9.21	9.63	10.05	10.47	10.90
145	.57	.99	1.41	1.84	2.26	2.68	3.10	3.52	3.94	4.36	4.78	5.20	5.63	6.05	6.47	6.89	7.31	7.73	8.15	8.57	8.99	9.42	9.84	10.26	10.68
144	.36	.78	1.20	1.62	2.04	2.46	2.88	3.30	3.72	4.15	4.57	4.99	5.41	5.83	6.25	6.67	7.09	7.51	7.94	8.36	8.78	9.20	9.62	10.04	10.46
143	.14	.56	.98	1.40	1.82	2.24	2.66	3.09	3.51	3.93	4.35	4.77	5.19	5.61	6.03	6.45	6.88	7.30	7.72	8.14	8.56	8.98	9.40	9.82	10.24
142	.08	.34	.76	1.18	1.61	2.03	2.45	2.87	3.29	3.71	4.13	4.55	4.97	5.40	5.82	6.24	6.66	7.08	7.50	7.92	8.34	8.76	9.19	9.61	10.03

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.08	.17	.25	.34
.1	.02	.11	.19	.27	.36
.2	.04	.13	.21	.30	.38
.3	.07	.15	.23	.32	.40
.4	.09	.17	.26	.34	.42
.5	.11	.19	.28	.36	.45
.6	.13	.21	.30	.38	.47
.7	.15	.24	.32	.40	.49
.8	.17	.26	.34	.43	.51
.9	.20	.28	.36	.45	.53

Table 73

Predicting Weight (Kilograms) of Girls, Age Fourteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .2170 height + .8422 hips + .6187 chest circumference + 3.7842 knee - 84.4909; R = .9041)

Chest Circumference, Centimeters	Knee Width, Centimeters																
	6.3	6.6	6.9	7.2	7.5	7.8	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1
90.0	44.03	45.17	46.30	47.44	48.57	49.71	50.84	51.98	53.11	54.25	55.39	56.52	57.66	58.79	59.93	61.06	62.20
88.5	43.10	44.24	45.38	46.51	47.65	48.78	49.92	51.05	52.19	53.32	54.46	55.59	56.73	57.86	59.00	60.13	61.27
87.0	42.18	43.31	44.45	45.58	46.72	47.85	48.99	50.12	51.26	52.39	53.53	54.66	55.80	56.93	58.07	59.21	60.34
85.5	41.25	42.38	43.52	44.65	45.79	46.92	48.06	49.20	50.33	51.47	52.60	53.74	54.87	56.01	57.14	58.28	59.41
84.0	40.32	41.46	42.59	43.73	44.86	46.00	47.13	48.27	49.40	50.54	51.67	52.81	53.94	55.08	56.21	57.35	58.48
82.5	39.39	40.53	41.66	42.80	43.93	45.07	46.20	47.34	48.47	49.61	50.74	51.88	53.02	54.15	55.29	56.42	57.56
81.0	38.46	39.60	40.73	41.87	43.01	44.14	45.28	46.41	47.55	48.68	49.82	50.95	52.09	53.22	54.36	55.49	56.63
79.5	37.54	38.67	39.81	40.94	42.08	43.21	44.35	45.48	46.62	47.75	48.89	50.02	51.16	52.29	53.43	54.57	55.70
78.0	36.61	37.74	38.88	40.01	41.15	42.28	43.42	44.55	45.69	46.83	47.96	49.10	50.23	51.37	52.50	53.64	54.77
76.5	35.68	36.82	37.95	39.09	40.22	41.36	42.49	43.63	44.76	45.90	47.03	48.17	49.30	50.44	51.57	52.71	53.84
75.0	34.75	35.89	37.02	38.16	39.29	40.43	41.56	42.70	43.83	44.97	46.10	47.24	48.38	49.51	50.65	51.78	52.92
73.5	33.82	34.96	36.09	37.23	38.37	39.50	40.64	41.77	42.91	44.04	45.18	46.31	47.45	48.58	49.72	50.85	51.99
72.0	32.90	34.03	35.17	36.30	37.44	38.57	39.71	40.84	41.98	43.11	44.25	45.38	46.52	47.65	48.79	49.92	51.06
70.5	31.97	33.10	34.24	35.37	36.51	37.64	38.78	39.91	41.05	42.19	43.32	44.46	45.59	46.73	47.86	49.00	50.13
69.0	31.04	32.18	33.31	34.45	35.58	36.72	37.85	38.99	40.12	41.26	42.39	43.53	44.66	45.80	46.93	48.07	49.20
67.5	30.11	31.25	32.38	33.52	34.65	35.79	36.92	38.06	39.19	40.33	41.46	42.60	43.73	44.87	46.01	47.14	48.28
66.0	29.18	30.32	31.45	32.59	33.72	34.86	36.00	37.13	38.27	39.40	40.54	41.67	42.81	43.94	45.08	46.21	47.35
64.5	28.26	29.39	30.53	31.66	32.80	33.93	35.07	36.20	37.34	38.47	39.61	40.74	41.88	43.01	44.15	45.28	46.42
63.0	27.33	28.46	29.60	30.73	31.87	33.00	34.14	35.27	36.41	37.55	38.68	39.82	40.95	42.09	43.22	44.36	45.49
61.5	26.40	27.53	28.67	29.81	30.94	32.08	33.21	34.35	35.48	36.62	37.75	38.89	40.02	41.16	42.29	43.43	44.56
60.0	25.47	26.61	27.74	28.88	30.01	31.15	32.28	33.42	34.55	35.69	36.82	37.96	39.09	40.23	41.37	42.50	43.64
58.5	24.54	25.68	26.81	27.95	29.08	30.22	31.36	32.49	33.63	34.76	35.90	37.03	38.17	39.30	40.44	41.57	42.71
57.0	23.62	24.75	25.89	27.02	28.16	29.29	30.43	31.56	32.70	33.83	34.97	36.10	37.26	38.37	39.51	40.64	41.78
55.5	22.69	23.82	24.96	26.09	27.23	28.36	29.50	30.63	31.77	32.90	34.04	35.18	36.31	37.45	38.58	39.72	40.85
54.0	21.76	22.89	24.03	25.17	26.30	27.44	28.57	29.71	30.84	31.98	33.11	34.25	35.38	36.52	37.65	38.79	39.92
52.5	20.83	21.97	23.10	24.24	25.37	26.51	27.64	28.78	29.91	31.05	32.18	33.32	34.45	35.59	36.72	37.86	39.00

Interpolation Table

Chest Circumference	Knee		
	0	.1	.2
0	0	.378	.757
.1	.062	.440	.819
.2	.124	.502	.881
.3	.186	.564	.942
.4	.247	.626	1.004
.5	.309	.688	1.066
.6	.371	.750	1.128
.7	.433	.812	1.190
.8	.495	.873	1.252
.9	.557	.935	1.314
1.0	.619	.997	1.376
1.1	.681	1.059	1.437
1.2	.742	1.121	1.499
1.3	.804	1.183	1.561
1.4	.866	1.245	1.623

Table 74

Predicting Weight (Kilograms) of Girls, Age Fifteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1546 height + .7290 hips + .5870 chest circumference + 4.7586 knee - 77.6805; R = .8480)

Height, Centimeters	Hip Width, Centimeters																				
	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5	32.0	32.5
177.0	5.09	5.45	5.82	6.18	6.54	6.91	7.27	7.64	8.00	8.37	8.73	9.10	9.46	9.82	10.19	10.55	10.92	11.28	11.65	12.01	12.38
175.5	4.85	5.22	5.58	5.95	6.31	6.68	7.04	7.40	7.77	8.13	8.50	8.86	9.23	9.59	9.96	10.32	10.69	11.05	11.41	11.78	12.14
174.0	4.62	4.99	5.35	5.71	6.08	6.44	6.81	7.17	7.54	7.90	8.27	8.63	9.00	9.36	9.72	10.09	10.45	10.82	11.18	11.55	11.91
172.5	4.39	4.75	5.12	5.48	5.85	6.21	6.58	6.94	7.31	7.67	8.03	8.40	8.76	9.13	9.49	9.86	10.22	10.59	10.95	11.32	11.68
171.0	4.16	4.52	4.89	5.25	5.62	5.98	6.34	6.71	7.07	7.44	7.80	8.17	8.53	8.90	9.26	9.63	9.99	10.35	10.72	11.08	11.45
169.5	3.93	4.29	4.66	5.02	5.38	5.75	6.11	6.48	6.84	7.21	7.57	7.94	8.30	8.66	9.03	9.39	9.76	10.12	10.49	10.85	11.22
168.0	3.69	4.06	4.42	4.79	5.15	5.52	5.88	6.25	6.61	6.97	7.34	7.70	8.07	8.43	8.80	9.16	9.53	9.89	10.25	10.62	10.98
166.5	3.46	3.83	4.19	4.56	4.92	5.28	5.65	6.01	6.38	6.74	7.11	7.47	7.84	8.20	8.56	8.93	9.29	9.66	10.02	10.39	10.75
165.0	3.23	3.59	3.96	4.32	4.69	5.05	5.42	5.78	6.15	6.51	6.88	7.24	7.60	7.97	8.33	8.70	9.06	9.43	9.79	10.16	10.52
163.5	3.00	3.36	3.73	4.09	4.46	4.82	5.19	5.55	5.91	6.28	6.64	7.01	7.37	7.74	8.10	8.47	8.83	9.19	9.56	9.92	10.29
162.0	2.77	3.13	3.50	3.86	4.22	4.59	4.95	5.32	5.68	6.05	6.41	6.78	7.14	7.50	7.87	8.23	8.60	8.96	9.33	9.69	10.06
160.5	2.53	2.90	3.26	3.63	3.99	4.36	4.72	5.09	5.45	5.81	6.18	6.54	6.91	7.27	7.64	8.00	8.37	8.73	9.10	9.46	9.82
159.0	2.30	2.67	3.03	3.40	3.76	4.12	4.49	4.85	5.22	5.58	5.95	6.31	6.68	7.04	7.41	7.77	8.13	8.50	8.86	9.23	9.59
157.5	2.07	2.44	2.80	3.16	3.53	3.89	4.26	4.62	4.99	5.35	5.72	6.08	6.44	6.81	7.17	7.54	7.90	8.27	8.63	9.00	9.36
156.0	1.84	2.20	2.57	2.93	3.30	3.66	4.03	4.39	4.75	5.12	5.48	5.85	6.21	6.58	6.94	7.31	7.67	8.04	8.40	8.76	9.13
154.5	1.61	1.97	2.34	2.70	3.06	3.43	3.79	4.16	4.52	4.89	5.25	5.62	5.98	6.35	6.71	7.07	7.44	7.80	8.17	8.53	8.90
153.0	1.37	1.74	2.10	2.47	2.83	3.20	3.56	3.93	4.29	4.66	5.02	5.38	5.75	6.11	6.48	6.84	7.21	7.57	7.94	8.30	8.66
151.5	1.14	1.51	1.87	2.24	2.60	2.97	3.33	3.69	4.06	4.42	4.79	5.15	5.52	5.88	6.25	6.61	6.97	7.34	7.70	8.07	8.43
150.0	.91	1.28	1.64	2.00	2.37	2.73	3.10	3.46	3.83	4.19	4.56	4.92	5.29	5.65	6.01	6.38	6.74	7.11	7.47	7.84	8.20
148.5	.68	1.04	1.41	1.77	2.14	2.50	2.87	3.23	3.60	3.96	4.32	4.69	5.05	5.42	5.78	6.15	6.51	6.88	7.24	7.60	7.97
147.0	.45	.81	1.18	1.54	1.91	2.27	2.63	3.00	3.36	3.73	4.09	4.46	4.82	5.19	5.55	5.91	6.28	6.64	7.01	7.37	7.74
145.5	.22	.58	.94	1.31	1.67	2.04	2.40	2.77	3.13	3.50	3.86	4.22	4.59	4.95	5.32	5.68	6.05	6.41	6.78	7.14	7.51

Interpolation Table

Height	Hips				
	0	.1	.2	.3	.4
0	0	.07	.15	.22	.29
.1	.02	.09	.16	.23	.31
.2	.03	.10	.18	.25	.32
.3	.05	.12	.19	.26	.34
.4	.06	.13	.21	.28	.35
.5	.08	.15	.22	.30	.37
.6	.09	.17	.24	.31	.38
.7	.11	.18	.25	.33	.40
.8	.12	.20	.27	.34	.42
.9	.14	.21	.29	.36	.43
1.0	.16	.23	.30	.37	.45
1.1	.17	.24	.32	.39	.46
1.2	.19	.26	.33	.40	.48
1.3	.20	.27	.35	.42	.49
1.4	.22	.29	.36	.44	.51

Table 75

Predicting Weight (Kilograms) of Girls, Age Fifteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																						
	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6
89	47.50	48.46	49.41	50.36	51.31	52.26	53.21	54.17	55.12	56.07	57.02	57.97	58.92	59.88	60.83	61.78	62.73	63.68	64.63	65.59	66.54	67.49	68.44
88	46.92	47.87	48.82	49.77	50.72	51.68	52.63	53.58	54.53	55.48	56.43	57.39	58.34	59.29	60.24	61.19	62.14	63.10	64.05	65.00	65.95	66.90	67.85
87	46.33	47.28	48.23	49.19	50.14	51.09	52.04	52.99	53.94	54.90	55.85	56.80	57.75	58.70	59.65	60.61	61.56	62.51	63.46	64.41	65.36	66.32	67.27
86	45.74	46.70	47.65	48.60	49.55	50.50	51.45	52.40	53.36	54.31	55.26	56.21	57.16	58.12	59.07	60.02	60.97	61.92	62.87	63.83	64.78	65.73	66.68
85	45.16	46.11	47.06	48.01	48.96	49.91	50.87	51.82	52.77	53.72	54.67	55.62	56.58	57.53	58.48	59.43	60.38	61.34	62.29	63.24	64.19	65.14	66.09
84	44.57	45.52	46.47	47.43	48.38	49.33	50.28	51.23	52.18	53.13	54.09	55.04	55.99	56.94	57.89	58.84	59.80	60.75	61.70	62.65	63.60	64.56	65.51
83	43.98	44.93	45.89	46.84	47.79	48.74	49.69	50.64	51.60	52.55	53.50	54.45	55.40	56.35	57.31	58.26	59.21	60.16	61.11	62.06	63.02	63.97	64.92
82	43.40	44.35	45.30	46.25	47.20	48.15	49.11	50.06	51.01	51.96	52.91	53.86	54.82	55.77	56.72	57.67	58.62	59.57	60.53	61.48	62.43	63.38	64.33
81	42.81	43.76	44.71	45.66	46.61	47.57	48.52	49.47	50.42	51.37	52.33	53.28	54.23	55.18	56.13	57.08	58.04	58.99	59.94	60.89	61.84	62.79	63.75
80	42.22	43.17	44.13	45.08	46.03	46.98	47.93	48.88	49.83	50.79	51.74	52.69	53.64	54.59	55.55	56.50	57.45	58.40	59.35	60.30	61.26	62.21	63.16
79	41.63	42.59	43.54	44.49	45.44	46.39	47.34	48.30	49.25	50.20	51.15	52.10	53.05	54.01	54.96	55.91	56.86	57.81	58.76	59.72	60.67	61.62	62.57
78	41.05	42.00	42.95	43.90	44.85	45.81	46.76	47.71	48.66	49.61	50.56	51.52	52.47	53.42	54.37	55.32	56.27	57.23	58.18	59.13	60.08	61.03	61.98
77	40.46	41.41	42.36	43.32	44.27	45.22	46.17	47.12	48.07	49.03	49.98	50.93	51.88	52.83	53.78	54.74	55.69	56.64	57.59	58.54	59.59	60.45	61.40
76	39.87	40.83	41.78	42.73	43.68	44.63	45.58	46.53	47.49	48.44	49.39	50.34	51.29	52.25	53.20	54.15	55.10	56.05	57.00	57.96	58.91	59.86	60.81
75	39.29	40.24	41.19	42.14	43.09	44.04	45.00	45.95	46.90	47.85	48.80	49.75	50.71	51.66	52.61	53.56	54.51	55.47	56.42	57.37	58.32	59.27	60.22
74	38.70	39.65	40.60	41.56	42.51	43.46	44.41	45.36	46.31	47.26	48.22	49.17	50.12	51.07	52.02	52.97	53.93	54.88	55.83	56.78	57.73	58.69	59.64
73	38.11	39.06	40.02	40.97	41.92	42.87	43.82	44.77	45.73	46.68	47.63	48.58	49.53	50.48	51.44	52.39	53.34	54.29	55.24	56.19	57.15	58.10	59.05
72	37.53	38.48	39.43	40.38	41.33	42.28	43.24	44.19	45.14	46.09	47.04	47.99	48.95	49.90	50.85	51.80	52.75	53.70	54.66	55.61	56.56	57.51	58.46
71	36.94	37.89	38.84	39.79	40.74	41.70	46.65	43.60	44.55	45.50	46.46	47.41	48.36	49.31	50.26	51.21	52.17	53.12	54.07	55.02	55.97	56.92	57.88
70	36.35	37.30	38.26	39.21	40.16	41.11	42.06	43.01	43.96	44.92	45.87	46.82	47.77	48.72	49.68	50.63	51.58	52.53	53.48	54.43	55.39	56.34	57.29
69	35.76	36.72	37.67	38.62	39.57	40.52	41.47	42.43	43.38	44.33	45.28	46.23	47.18	48.14	49.09	50.04	50.99	51.94	52.89	53.85	54.80	55.75	56.70
68	35.18	36.13	37.08	38.03	38.98	39.94	40.89	41.84	42.79	43.74	44.69	45.65	46.60	47.55	48.50	49.45	50.40	51.36	52.31	53.26	54.21	55.16	56.11
67	34.59	35.54	36.49	37.45	38.39	39.34	40.29	41.25	42.20	43.15	44.11	45.05	46.01	46.96	47.91	48.86	49.82	50.77	51.72	52.67	53.62	54.58	55.33
66	34.00	34.96	35.91	36.86	37.80	38.75	39.71	40.66	41.61	42.56	43.52	44.46	45.42	46.37	47.32	48.27	49.23	50.17	51.13	52.08	53.03	53.98	54.94
65	33.42	34.37	35.32	36.27	37.22	38.17	39.13	40.08	41.03	41.98	42.93	43.88	44.84	45.79	46.74	47.69	48.64	49.60	50.55	51.50	52.45	53.40	54.35
64	32.83	33.78	34.73	35.69	36.64	37.59	38.54	39.49	40.44	41.39	42.35	43.30	44.25	45.20	46.15	47.10	48.06	49.01	49.96	50.91	51.86	52.82	53.77
63	32.24	33.19	34.15	35.10	36.05	37.00	37.95	38.90	39.86	40.81	41.76	42.71	43.66	44.61	45.57	46.52	47.47	48.42	49.37	50.32	51.28	52.23	53.18
62	31.66	32.61	33.56	34.51	35.46	36.41	37.37	38.32	39.27	40.22	41.17	42.12	43.08	44.03	44.98	45.93	46.88	47.83	48.78	49.74	50.69	51.64	52.59
61	31.07	32.02	32.97	33.92	34.87	35.83	36.78	37.73	38.68	39.63	40.59	41.54	42.49	43.44	44.39	45.34	46.30	47.25	48.20	49.15	50.10	51.05	52.01
60	30.48	31.43	32.39	33.34	34.29	35.24	36.19	37.14	38.10	39.05	40.00	40.95	41.90	42.85	43.81	44.76	45.71	46.66	47.61	48.56	49.52	50.47	51.42
59	29.89	30.85	31.80	32.75	33.70	34.65	35.61	36.56	37.51	38.46	39.41	40.36	41.32	42.27	43.22	44.17	45.12	46.07	47.03	47.98	48.93	49.88	50.83
58	29.31	30.26	31.21	32.16	33.11	34.07	35.02	35.97	36.92	37.87	38.83	39.78	40.73	41.68	42.63	43.58	44.54	45.49	46.44	47.39	48.34	49.29	50.25
57	28.72	29.67	30.62	31.58	32.53	33.48	34.43	35.38	36.33	37.29	38.24	39.19	40.14	41.09	42.05	43.00	43.95	44.90	45.85	46.80	47.76	48.71	49.66
56	28.15	29.09	30.04	30.99	31.94	32.89	33.84	34.80	35.75	36.70	37.65	38.60	39.55	40.51	41.46	42.41	43.36	44.31	45.26	46.22	47.17	48.12	49.07
55	27.55	28.50	29.45	30.40	31.35	32.31	33.26	34.21	35.16	36.11	37.06	38.02	38.97	39.92	40.87	41.82	42.77	43.73	44.68	45.63	46.58	47.53	48.48

Interpolation Table.

Chest Circumference	Knee	
	0	.1
0	0	.476
.1	.059	.535
.2	.117	.593
.3	.176	.652
.4	.235	.711
.5	.294	.769
.6	.352	.828
.7	.411	.887
.8	.470	.945
.9	.528	1.004

Table 76

Predicting Weight (Kilograms) of Girls, Age Sixteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Height, Centimeters	Hip Width, Centimeters																								
	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.3	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.4	32.8
179	4.32	4.76	5.20	5.64	6.08	6.52	6.95	7.39	7.83	8.27	8.71	9.15	9.59	10.03	10.47	10.91	11.35	11.78	12.22	12.66	13.10	13.54	13.98	14.42	14.86
178	4.19	4.62	5.06	5.50	5.94	6.38	6.82	7.26	7.70	8.14	8.58	9.02	9.45	9.89	10.33	10.77	11.21	11.65	12.09	12.53	12.97	13.41	13.85	14.28	14.72
177	4.05	4.49	4.93	5.37	5.81	6.25	6.69	7.12	7.56	8.00	8.44	8.88	9.32	9.76	10.20	10.64	11.08	11.52	11.95	12.39	12.83	13.27	13.71	14.15	14.59
176	3.92	4.36	4.79	5.23	5.67	6.11	6.55	6.99	7.43	7.87	8.31	8.75	9.19	9.62	10.06	10.50	10.94	11.38	11.82	12.26	12.70	13.14	13.58	14.01	14.45
175	3.78	4.22	4.66	5.10	5.54	5.98	6.42	6.85	7.29	7.73	8.17	8.61	9.05	9.49	9.93	10.37	10.81	11.25	11.68	12.12	12.56	13.00	13.44	13.88	14.32
174	3.65	4.09	4.52	4.96	5.40	5.84	6.28	6.72	7.16	7.60	8.04	8.48	8.91	9.35	9.79	10.23	10.67	11.11	11.55	11.99	12.43	12.87	13.31	13.74	14.18
173	3.51	3.95	4.39	4.83	5.27	5.71	6.15	6.58	7.02	7.46	7.90	8.34	8.78	9.22	9.66	10.10	10.54	10.98	11.41	11.85	12.29	12.73	13.17	13.61	14.05
172	3.38	3.82	4.26	4.69	5.13	5.57	6.01	6.45	6.89	7.33	7.77	8.21	8.65	9.08	9.52	9.96	10.40	10.84	11.28	11.72	12.16	12.60	13.04	13.48	13.91
171	3.24	3.68	4.12	4.56	5.00	5.44	5.88	6.32	6.75	7.19	7.63	8.07	8.51	8.95	9.39	9.83	10.27	10.71	11.14	11.58	12.02	12.46	12.90	13.34	13.78
170	3.11	3.55	3.99	4.42	4.86	5.30	5.74	6.18	6.62	7.06	7.50	7.94	8.38	8.81	9.25	9.69	10.13	10.57	11.01	11.45	11.89	12.33	12.77	13.21	13.64
169	2,97	3.41	3.85	4.29	4.73	5.17	5.61	6.05	6.48	6.92	7.36	7.80	8.24	8.68	9.12	9.56	10.00	10.44	10.88	11.31	11.75	12.19	12.63	13.07	13.51
168	2.84	3.28	3.72	4.15	4.59	5.03	5.47	5.91	6.35	6.79	7.23	7.67	8.11	8.55	8.98	9.42	9.86	10.30	10.74	11.18	11.62	12.06	12.50	12.94	13.38
167	2.70	3.14	3.58	4.02	4.46	4.90	5.34	5.78	6.22	6.65	7.09	7.53	7.97	8.41	8.85	9.29	9.73	10.17	10.61	11.05	11.48	11.92	12.36	12.80	13.24
166	2.57	3.01	3.45	3.89	3.42	4.76	5.20	5.64	6.08	6.53	6.96	7.40	7.84	8.28	8.72	9.15	9.59	10.03	10.47	10.91	11.35	11.79	12.23	12.67	13.11
165	2.43	2.87	3.31	3.75	4.19	4.63	5.07	5.51	5.95	6.39	6.82	7.26	7.70	8.14	8.58	9.02	9.46	9.90	10.34	10.78	11.21	11.65	12.09	12.53	12.97
164	2.30	2.74	3.18	3.62	4.05	4.49	4.93	5.37	5.81	6.25	6.69	7.13	7.57	8.01	8.45	8.88	9.32	9.76	10.20	10.64	11.08	11.52	11.96	12.40	12.84
163	2.16	2.60	3.04	3.48	3.92	4.36	4.80	5.24	5.68	6.12	6.55	6.99	7.43	7.87	8.31	8.75	9.19	9.63	10.07	10.51	10.95	11.38	11.82	12.26	12.70
162	2.03	2.47	2.91	3.35	3.79	4.22	4.66	5.10	5.54	5.98	6.42	6.86	7.30	7.74	8.18	8.62	9.05	9.49	9.93	10.37	10.81	11.25	11.69	12.13	12.57
161	1.90	2.33	2.77	3.21	3.65	4.09	4.53	4.97	5.41	5.85	6.29	6.72	7.16	7.60	8.04	8.48	8.92	9.36	9.80	10.24	10.68	11.12	11.55	11.99	12.43
160	1.76	2.20	2.64	3.08	3.52	3.96	4.39	4.83	5.27	5.71	6.15	6.59	7.03	7.47	7.91	8.35	8.79	9.22	9.66	10.10	10.54	10.98	11.42	11.86	12.30
159	1.63	2.07	2.50	2.94	3.38	3.82	4.26	4.70	5.14	5.58	6.02	6.46	6.89	7.33	7.77	8.21	8.65	9.09	9.53	9.97	10.41	10.85	11.28	11.72	12.16
158	1.49	1.93	2.37	2.81	3.25	3.69	4.12	4.56	5.00	5.44	5.88	6.32	6.76	7.20	7.64	8.08	8.52	8.95	9.39	9.83	10.27	10.71	11.15	11.59	12.03
157	1.36	1.80	2.23	2.67	3.11	3.55	3.99	4.43	4.87	5.31	5.75	6.19	6.62	7.06	7.50	7.94	8.38	8.82	9.26	9.70	10.14	10.58	11.02	11.45	11.89
156	1.22	1.66	2.10	2.54	2.98	3.42	3.86	4.29	4.73	5.17	5.61	6.05	6.49	6.93	7.37	7.81	8.25	8.69	9.12	9.56	10.00	10.44	10.88	11.32	11.76
155	1.09	1.53	1.97	2.40	2.84	3.28	3.72	4.16	4.60	5.04	5.48	5.92	6.36	6.79	7.23	7.67	8.11	8.55	8.99	9.43	9.87	10.31	10.75	11.19	11.62
154	.95	1.39	1.83	2.27	2.71	3.15	3.59	4.03	4.46	4.90	5.34	5.78	6.22	6.66	7.10	7.54	7.98	8.42	8.86	9.29	9.73	10.17	10.61	11.05	11.49
153	.82	1.26	1.70	2.13	2.57	3.01	3.45	3.89	4.33	4.77	5.21	5.65	6.09	6.52	6.96	7.40	7.84	8.28	8.72	9.16	9.60	10.04	10.48	10.92	11.35
152	.68	1.12	1.56	2.00	2.44	2.88	3.32	3.76	4.19	4.63	5.07	5.51	5.95	6.39	6.83	7.27	7.71	8.15	8.59	9.02	9.46	9.90	10.34	10.78	11.22
151	.55	.99	1.43	1.86	2.30	2.74	3.18	3.62	4.06	4.50	4.94	5.38	5.82	6.26	6.69	7.13	7.57	8.01	8.45	8.89	9.33	9.77	10.21	10.65	11.09
150	.41	.85	1.29	1.73	2.17	2.61	3.05	3.49	3.93	4.36	4.80	5.24	3.68	6.12	6.56	7.00	7.44	7.88	8.32	8.76	9.19	9.63	10.07	10.51	10.95
149	.28	.72	1.16	1.60	2.03	2.47	2.91	3.35	3.79	4.23	4.67	5.11	5.55	5.99	6.43	6.86	7.30	7.74	8.18	8.62	9.06	9.50	9.94	10.38	10.82
148	.14	.58	1.02	1.46	1.90	2.34	2.78	3.22	3.66	4.10	4.53	4.97	5.41	5.85	6.29	6.73	7.17	7.61	8.05	8.49	8.93	9.36	9.80	10.24	10.68
147	.01	.45	.89	1.33	1.77	2.20	2.64	3.08	3.52	3.96	4.40	4.84	5.28	5.72	6.16	6.59	7.03	7.47	7.91	8.35	8.79	9.23	9.67	10.11	10.55
146	- .12	.31	.75	1.19	1.63	2.07	2.51	2.95	3.39	3.83	4.26	4.70	5.14	5.58	6.02	6.46	6.90	7.34	7.78	8.22	8.66	9.09	9.53	9.97	10.41
145	- .26	.18	.62	1.06	1.50	1.94	2.37	2.81	3.25	3.69	4.13	4.57	5.01	5.45	5.89	6.33	6.77	7.20	7.64	8.08	8.52	8.96	9.40	9.84	10.28

Interpolation Table

Height	Hips 0	.1	.2	.3
0	0	.11	.22	.33
.1	.01	.12	.23	.34
.2	.03	.14	.25	.36
.3	.04	.15	.26	.37
.4	.05	.16	.27	.38
.5	.07	.18	.29	.40
.6	.08	.19	.30	.41
.7	.09	.20	.31	.42
.8	.11	.22	.33	.44
.9	.12	.23	.34	.45

Table 77

Predicting Weight (Kilograms) of Girls, Age Sixteen Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1347 height + 1.0977 hips + .5353 chest circumference + 4.8507 knee - 82.2578; R = .8749)

Chest Circumference, Centimeters	Knee Width, Centimeters																								
	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8
89	44.60	45.57	46.54	47.51	48.48	49.45	50.42	51.39	52.36	53.33	54.30	55.27	56.24	57.21	58.18	59.15	60.12	61.09	62.06	63.03	64.00	64.97	65.94	66.91	67.88
88	44.06	45.03	46.00	46.97	47.95	48.91	49.88	50.85	51.82	52.79	53.76	54.73	55.70	56.67	57.64	58.61	59.58	60.55	61.52	62.49	63.46	64.43	65.40	66.37	67.34
87	43.53	44.50	45.47	46.44	47.41	48.38	49.35	50.32	51.29	52.26	53.23	54.20	55.17	56.14	57.11	58.08	59.05	60.02	60.99	61.96	62.93	63.90	64.87	65.84	66.81
86	42.99	43.96	44.93	45.90	46.87	47.84	48.81	49.78	50.75	51.72	52.69	53.66	54.63	55.60	56.57	57.54	58.51	59.48	60.45	61.42	62.39	63.36	64.33	65.30	66.27
85	42.46	43.43	44.40	45.36	46.33	47.31	48.28	49.25	50.22	51.19	52.16	53.13	54.10	55.07	56.04	57.01	57.98	58.95	59.92	60.89	61.86	62.83	63.80	64.77	65.74
84	41.92	42.89	43.86	44.83	45.80	46.70	47.74	48.71	49.68	50.65	51.62	52.59	53.56	54.53	55.50	56.47	57.44	58.41	59.38	60.35	61.32	62.29	63.26	64.23	65.20
83	41.38	42.35	43.33	44.29	45.26	46.23	47.20	48.17	49.14	50.12	51.09	52.06	53.03	54.00	54.97	55.94	56.91	57.88	58.85	59.82	60.79	61.76	62.73	63.70	64.67
82	40.85	41.82	42.79	43.76	44.73	45.70	46.67	47.64	48.61	49.59	50.55	51.52	52.49	53.46	54.43	55.40	56.37	57.34	58.31	59.28	60.25	61.22	62.19	63.16	64.13
81	40.31	41.28	42.25	43.22	44.19	45.16	46.13	47.10	48.07	49.04	50.01	50.98	51.95	52.93	53.90	54.87	55.84	56.81	57.78	58.75	59.72	60.69	61.66	62.63	63.60
80	39.78	40.75	41.72	42.69	43.66	44.63	45.60	46.57	47.54	48.51	49.48	50.45	51.42	52.39	53.36	54.33	55.30	56.27	57.24	58.21	59.18	60.15	61.12	62.09	63.06
79	39.24	40.21	41.18	42.15	43.12	44.09	45.06	46.03	47.00	47.97	48.94	49.91	50.88	51.85	52.82	53.79	54.76	55.73	56.71	57.68	58.65	59.62	60.59	61.56	62.53
78	38.71	39.68	40.65	41.62	42.59	43.56	44.53	45.50	46.47	47.44	48.41	49.38	50.35	51.32	52.29	53.26	54.23	55.20	56.17	57.14	58.11	59.08	60.05	61.02	61.99
77	38.17	39.14	40.11	41.08	42.05	43.02	43.99	44.96	45.93	46.90	47.87	48.84	49.81	50.78	51.75	52.72	53.69	54.66	55.63	56.60	57.57	58.54	59.52	60.49	61.46
76	37.64	38.61	39.58	40.55	41.52	42.49	43.46	44.43	45.40	46.37	47.34	48.31	49.28	50.25	51.22	52.19	53.16	54.13	55.10	56.07	57.04	58.01	58.98	59.95	60.92
75	37.10	38.07	39.04	40.01	40.98	41.95	42.92	43.89	44.86	45.83	46.30	47.77	48.74	49.71	50.68	51.65	52.62	53.59	54.56	55.53	56.50	57.47	58.44	59.41	60.38
74	36.57	37.54	38.51	39.48	40.45	41.42	42.39	43.36	44.33	45.30	46.27	47.24	48.21	49.18	50.15	51.12	52.09	53.06	54.03	55.00	55.97	56.94	57.91	58.88	59.85
73	36.03	37.00	37.97	38.94	39.91	40.88	41.85	42.82	43.79	44.76	45.73	46.70	47.67	48.64	49.61	50.58	51.55	52.52	53.49	54.46	55.43	56.40	57.37	58.34	59.31
72	35.50	36.47	37.44	38.41	39.38	40.35	41.32	42.29	43.26	44.23	45.20	46.17	47.14	48.11	49.08	50.05	51.02	51.99	52.96	53.93	54.90	55.87	56.84	57.81	58.78
71	34.96	35.93	36.90	37.87	38.84	39.81	40.78	41.75	42.72	43.69	44.66	45.63	46.60	47.57	48.54	49.51	50.48	51.45	52.42	53.39	54.36	55.33	56.30	57.27	58.24
70	34.43	35.40	36.37	37.34	38.31	39.28	40.25	41.22	42.19	43.16	44.13	45.10	46.07	47.04	48.01	48.98	49.95	50.92	51.89	52.86	53.83	54.30	55.77	56.74	57.71
69	33.89	34.86	35.83	36.80	37.77	38.74	39.71	40.68	41.65	42.62	43.59	44.56	45.53	46.50	47.47	48.44	49.41	50.38	51.35	52.32	53.29	54.26	55.23	56.20	57.17
68	33.36	34.33	35.30	36.26	37.23	38.21	39.18	40.15	41.12	42.09	43.06	44.03	45.00	45.97	46.94	47.91	48.88	49.85	50.82	51.79	52.76	53.73	54.70	55.67	56.64
67	32.32	33.79	34.76	35.73	36.70	37.67	38.64	39.61	40.58	41.55	42.52	43.49	44.46	45.43	46.40	47.37	48.34	49.31	50.28	51.25	52.22	53.19	54.16	55.13	56.10
66	32.28	33.25	34.22	35.19	36.16	37.13	38.10	39.07	40.04	41.01	41.99	42.96	43.93	44.90	45.87	46.84	47.81	48.78	49.75	50.72	51.69	52.66	53.63	54.60	55.57
65	31.75	32.72	33.69	34.66	35.63	36.60	37.57	38.54	39.51	40.48	41.45	42.42	43.39	44.36	45.33	46.30	47.27	48.24	49.21	50.18	51.15	52.12	53.09	54.06	55.03
64	31.21	32.18	33.15	34.12	35.09	36.06	37.03	38.00	38.97	39.94	40.91	41.88	42.85	43.82	44.80	45.77	46.74	47.71	48.68	49.65	50.62	51.59	52.56	53.53	54.50
63	30.68	31.65	32.52	33.59	34.56	35.53	36.50	37.47	38.44	39.41	40.38	41.35	42.32	43.29	44.26	45.23	46.20	47.17	48.14	49.11	50.08	51.05	52.02	52.99	53.96
62	30.14	31.11	32.08	33.05	34.02	34.99	35.96	36.93	37.90	38.87	39.84	40.81	41.78	42.75	43.72	44.69	45.66	46.63	47.61	48.58	49.55	50.52	51.49	52.46	53.43
61	29.61	30.58	31.55	32.52	33.49	34.46	35.43	36.40	37.37	38.34	39.31	40.28	41.25	42.22	43.19	44.16	45.13	46.10	47.07	48.04	49.01	49.98	50.95	51.92	52.89
60	29.07	30.04	31.01	31.98	32.95	33.92	34.89	35.36	36.83	37.80	38.77	39.74	40.71	41.68	42.65	43.63	44.60	45.57	46.54	47.51	48.48	49.45	50.42	51.39	52.36
59	28.54	29.51	30.48	31.45	32.42	33.39	34.36	35.33	36.30	37.27	38.24	39.21	40.18	41.15	42.12	43.09	44.06	45.03	46.00	46.97	47.94	48.91	49.88	50.85	51.82
58	28.00	28.97	29.94	30.91	31.88	32.85	33.82	34.79	35.76	36.73	37.70	38.67	39.64	40.61	41.58	42.55	43.52	44.49	45.46	46.43	47.41	48.38	49.35	50.32	51.29
57	27.47	28.44	29.41	30.38	31.35	32.32	33.29	34.26	35.23	36.20	37.17	38.14	39.11	40.08	41.05	42.02	42.99	43.96	44.93	45.90	46.87	47.84	48.81	49.78	50.75
56	26.93	27.90	28.87	29.84	30.81	31.78	32.75	33.72	34.69	35.66	36.63	37.60	38.57	39.54	40.51	41.48	42.45	43.42	44.39	45.36	46.33	47.30	48.27	49.24	50.22

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.485
.1	.054	.539
.2	.107	.592
.3	.161	.646
.4	.214	.699
.5	.268	.753
.6	.321	.806
.7	.375	.860
.8	.428	.913
.9	.482	.967

Table 78

Predicting Weight (Kilograms) of Girls, Age Seventeen Years, From Height, Hips, Chest Circumference and Knee (Centimeters) (Weight = .1233 height + 1.0291 hips + .4985 chest circumference + 3.7574 knee - 64.6120; R = .8729)

Height, Centimeters	Hip Width, Centimeters																								
	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.4	32.8
180.0	41.46	41.87	42.28	42.69	43.10	43.52	43.93	44.34	44.75	45.16	45.57	45.99	46.40	46.81	47.22	47.63	48.04	48.46	48.87	49.28	49.69	50.10	50.51	50.92	51.34
178.5	41.27	41.68	42.10	42.51	42.92	43.33	43.74	44.15	44.57	44.98	45.39	45.80	46.21	46.62	47.04	47.45	47.86	48.27	48.68	49.09	49.50	49.92	50.33	50.74	51.15
177.0	41.09	41.50	41.91	42.32	42.73	43.15	43.56	43.97	44.38	44.79	45.20	45.62	46.03	46.44	46.85	47.26	47.67	48.09	48.50	48.91	49.32	49.73	50.14	50.55	50.97
175.5	40.90	41.31	41.73	42.14	42.55	42.96	43.37	43.78	44.20	44.61	45.02	45.43	45.84	46.25	46.67	47.08	47.49	47.90	48.31	48.72	49.14	49.55	49.96	50.37	50.78
174.0	40.72	41.13	41.54	41.95	42.36	42.78	43.19	43.60	44.01	44.42	44.83	45.25	45.66	46.07	46.48	46.89	47.30	47.72	48.13	48.54	48.95	49.36	49.77	50.19	50.60
172.5	40.53	40.94	41.36	41.77	42.18	42.59	43.00	43.41	43.83	44.24	44.65	45.06	45.47	45.88	46.30	46.71	47.12	47.53	47.94	48.35	48.77	49.18	49.59	50.00	50.41
171.0	40.35	40.76	41.17	41.58	41.99	42.41	42.82	43.23	43.64	44.05	44.46	44.88	45.29	45.70	46.11	46.52	46.93	47.35	47.76	48.17	48.58	48.99	49.40	49.82	50.23
169.5	40.16	40.57	40.99	41.40	41.81	42.22	42.63	43.04	43.46	43.87	44.28	44.69	45.10	45.51	45.93	46.34	46.75	47.16	47.57	47.98	48.40	48.81	49.22	49.63	50.04
168.0	39.98	40.39	40.80	41.21	41.62	42.04	42.45	42.86	43.27	43.68	44.09	44.51	44.92	45.33	45.74	46.15	46.56	46.98	47.39	47.80	48.21	48.62	49.03	49.45	49.86
166.5	39.79	40.20	40.62	41.03	41.44	41.85	42.26	42.67	43.09	43.50	43.91	44.32	44.73	45.14	45.56	45.97	46.38	46.79	47.20	47.61	48.03	48.44	48.85	49.26	49.67
165.0	39.61	40.02	40.43	40.84	41.25	41.67	42.08	42.49	42.90	43.31	43.72	44.14	44.55	44.96	45.37	45.78	46.19	46.61	47.02	47.43	47.84	48.25	48.66	49.08	49.49
163.5	39.42	39.83	40.25	40.66	41.07	41.48	41.89	42.30	42.72	43.13	43.54	43.95	44.36	44.77	45.19	45.60	46.01	46.42	46.83	47.24	47.66	48.07	48.48	48.89	49.30
162.0	39.24	39.65	40.06	40.47	40.88	41.30	41.71	42.12	42.53	42.94	43.35	43.77	44.18	44.59	45.00	45.41	45.82	46.24	46.65	47.06	47.47	47.88	48.29	48.71	49.12
160.5	39.05	39.46	39.88	40.29	40.70	41.11	41.52	41.93	42.35	42.76	43.17	43.58	43.99	44.40	44.82	45.23	45.64	46.05	46.46	46.87	47.29	47.70	48.11	48.52	48.93
159.0	38.87	39.28	39.69	40.10	40.51	40.93	41.34	41.75	42.16	42.57	42.98	43.40	43.81	44.22	44.63	45.04	45.45	45.87	46.28	46.69	47.10	47.51	47.92	48.34	48.75
157.5	38.68	39.09	39.51	39.92	40.33	40.74	41.15	41.56	41.98	42.39	42.80	43.21	43.62	44.03	44.45	44.86	45.27	45.68	46.09	46.50	46.92	47.33	47.74	48.15	48.56
156.0	38.50	38.91	39.32	39.73	40.14	40.56	40.97	41.38	41.79	42.20	42.61	43.03	43.44	43.85	44.26	44.67	45.08	45.50	45.91	46.32	46.73	47.14	47.55	47.97	48.38
154.5	38.31	38.72	39.14	39.55	39.96	40.37	40.78	41.19	41.61	42.02	42.43	42.84	43.25	43.66	44.08	44.49	44.90	45.31	45.72	46.13	46.55	46.96	47.37	47.78	48.19
153.0	38.13	38.54	38.95	39.36	39.77	40.19	40.60	41.01	41.42	41.83	42.24	42.66	43.07	43.48	43.89	44.30	44.71	45.13	45.54	45.95	46.36	46.77	47.18	47.60	48.01
151.5	37.94	38.35	38.77	39.18	39.59	40.00	40.41	40.82	41.24	41.65	42.06	42.47	42.88	43.29	43.71	44.12	44.53	44.94	45.35	45.76	46.18	46.59	47.00	47.41	47.82
150.0	37.76	38.17	38.58	38.99	39.40	39.82	40.23	40.64	41.05	41.46	41.87	42.29	42.70	43.11	43.52	43.93	44.34	44.76	45.17	45.58	45.99	46.40	46.81	47.23	47.64
148.5	37.57	37.98	38.40	38.81	39.22	39.63	40.04	40.45	40.87	41.28	41.69	42.10	42.51	42.92	43.34	43.75	44.16	44.57	44.98	45.39	45.81	46.22	46.63	47.04	47.45
147.0	37.39	37.80	38.21	38.62	39.03	39.45	39.86	40.27	40.68	41.09	41.50	41.92	42.33	42.74	43.15	43.56	43.97	44.39	44.80	45.21	45.62	46.03	46.44	46.86	47.27
145.5	37.20	37.61	38.03	38.44	38.85	39.26	39.67	40.08	40.50	40.91	41.32	41.73	42.14	42.55	42.97	43.38	43.79	44.20	44.61	45.02	45.44	45.85	46.26	46.67	47.08
144.0	37.02	37.43	37.84	38.25	38.66	39.08	39.49	39.90	40.31	40.72	41.13	41.55	41.96	42.37	42.78	43.19	43.60	44.02	44.43	44.84	45.25	45.66	46.07	46.49	46.90
142.5	36.83	37.25	37.66	38.07	38.48	38.89	39.30	39.71	40.13	40.54	40.95	41.36	41.77	42.18	42.60	43.01	43.42	43.83	44.24	44.65	45.07	45.48	45.89	46.30	46.71
141.0	36.65	37.06	37.47	37.88	38.29	38.71	39.12	39.53	39.94	40.35	40.76	41.18	41.59	42.00	42.41	42.82	43.23	43.65	44.06	44.47	44.88	45.29	45.70	46.12	46.53

Interpolation Table

Height	Hips			
	0	.1	.2	.3
0	0	.10	.21	.31
.1	.01	.12	.22	.32
.2	.02	.13	.23	.33
.3	.04	.14	.24	.35
.4	.05	.15	.25	.36
.5	.06	.16	.27	.37
.6	.07	.18	.28	.38
.7	.09	.19	.29	.39
.8	.10	.20	.30	.41
.9	.11	.21	.32	.42
1.0	.12	.23	.33	.43
1.1	.14	.24	.34	.44
1.2	.15	.25	.35	.46
1.3	.16	.26	.37	.47
1.4	.17	.28	.38	.48

Table 79

Predicting Weight (Kilograms) of Girls, Age Seventeen Years, From Height, Hips, Chest Circumference and Knee (Centimeters)

Chest Circumference, Centimeters	Knee Width, Centimeters																								
	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8	12.0
87	10.42	11.17	11.93	12.68	13.43	14.18	14.93	15.68	16.43	17.19	17.94	18.69	19.44	20.19	20.94	21.69	22.45	23.20	23.95	24.70	25.45	26.20	26.96	27.71	28.46
86	9.92	10.68	11.43	12.18	12.93	13.68	14.43	15.18	15.94	16.69	17.44	18.19	18.94	19.69	20.45	21.20	21.95	22.70	23.45	24.20	24.95	25.71	26.46	27.21	27.96
85	9.43	10.18	10.93	11.68	12.43	13.18	13.93	14.69	15.44	16.19	16.94	17.69	18.44	19.20	19.95	20.70	21.45	22.20	22.95	23.70	24.46	25.21	25.96	26.71	27.46
84	8.93	9.68	10.43	11.18	11.93	12.68	13.44	14.19	14.94	15.69	16.44	17.19	17.95	18.70	19.45	20.20	20.95	21.70	22.45	23.21	23.96	24.71	25.46	26.21	26.96
83	8.43	9.18	9.93	10.68	11.43	12.19	12.94	13.69	14.44	15.19	15.94	16.70	17.45	18.20	18.95	19.70	20.45	21.20	21.96	22.71	23.46	24.21	24.96	25.71	26.46
82	7.93	8.68	9.43	10.18	10.94	11.69	12.44	13.19	13.94	14.69	15.45	16.20	16.95	17.70	18.45	19.20	19.95	20.71	21.46	22.21	22.96	23.71	24.46	25.21	25.97
81	7.43	8.18	8.93	9.69	10.44	11.19	11.94	12.69	13.44	14.20	14.95	15.70	16.45	17.20	17.95	18.70	19.46	20.21	20.96	21.71	22.46	23.21	23.96	24.72	25.47
80	6.93	7.68	8.44	9.19	9.94	10.69	11.44	12.19	12.95	13.70	14.45	15.20	15.95	16.70	17.45	18.21	18.96	19.71	20.46	21.21	21.96	22.71	23.47	24.22	24.97
79	6.43	7.19	7.94	8.69	9.44	10.19	10.94	11.70	12.45	13.20	13.95	14.70	15.45	16.20	16.96	17.71	18.46	19.21	19.96	20.71	21.46	22.22	22.97	23.72	24.47
78	5.94	6.69	7.44	8.19	8.94	9.69	10.45	11.20	11.95	12.70	13.45	14.20	14.95	15.71	16.46	17.21	17.96	18.71	19.46	20.21	20.97	21.72	22.47	23.22	23.97
77	5.44	6.19	6.94	7.69	8.44	9.20	9.95	10.70	11.45	12.20	12.95	13.70	14.46	15.21	15.96	16.71	17.46	18.21	18.96	19.72	20.47	21.22	21.97	22.72	23.47
76	4.94	5.69	6.44	7.19	7.95	8.70	9.45	10.20	10.95	11.70	12.45	13.21	13.96	14.71	15.46	16.21	16.96	17.71	18.47	19.22	19.97	20.72	21.47	22.22	22.97
75	4.44	5.19	5.94	6.70	7.45	8.20	8.95	9.70	10.45	11.20	11.96	12.71	13.46	14.21	14.96	15.71	16.46	17.22	17.97	18.72	19.47	20.22	20.97	21.72	22.48
74	3.94	4.69	5.45	6.20	6.95	7.70	8.45	9.20	9.95	10.71	11.46	12.21	12.96	13.71	14.46	15.21	15.97	16.72	17.47	18.22	18.97	19.72	20.47	21.23	21.98
73	3.44	4.20	4.95	5.70	6.45	7.20	7.95	8.70	9.46	10.21	10.96	11.71	12.46	13.21	13.96	14.72	15.47	16.22	16.97	17.72	18.47	19.22	19.98	20.73	21.48
72	2.95	3.70	4.45	5.20	5.95	6.70	7.45	8.21	8.96	9.71	10.46	11.21	11.96	12.71	13.47	14.22	14.97	15.72	16.47	17.22	17.97	18.73	19.48	20.23	20.98
71	2.45	3.20	3.95	4.70	5.45	6.20	6.96	7.71	8.46	9.21	9.96	10.71	11.46	12.22	12.97	13.72	14.47	15.22	15.97	16.72	17.48	18.23	18.98	19.73	20.48
70	1.95	2.70	3.45	4.20	4.95	5.71	6.46	7.21	7.96	8.71	9.46	10.21	10.97	11.72	12.47	13.22	13.97	14.72	15.47	16.23	16.98	17.73	18.48	19.23	19.98
69	1.45	2.20	2.95	3.70	4.46	5.21	5.96	6.71	7.46	8.21	8.96	9.72	10.47	11.22	11.97	12.72	13.47	14.22	14.98	15.73	16.48	17.23	17.98	18.73	19.49
68	.95	1.70	2.45	3.21	3.96	4.71	5.46	6.21	6.96	7.71	8.47	9.22	9.97	10.72	11.47	12.22	12.97	13.73	14.48	15.23	15.98	16.73	17.48	18.24	18.99
67	.45	1.20	1.96	2.71	3.46	4.21	4.96	5.71	6.46	7.22	7.97	8.72	9.47	10.22	10.97	11.72	12.47	13.23	13.98	14.73	15.48	16.23	16.99	17.74	18.49
66	- .05	.71	1.46	2.21	2.96	3.71	4.46	5.21	5.97	6.72	7.47	8.22	8.97	9.72	10.48	11.23	11.98	12.73	13.48	14.23	14.98	16.74	16.49	17.24	17.99
65	- .54	.21	.96	1.71	2.46	3.21	3.96	4.72	5.47	6.22	6.97	7.72	8.47	9.23	9.98	10.73	11.48	12.23	12.98	13.73	14.49	15.24	15.99	16.74	17.49
64	-1.04	- .29	.46	1.21	1.96	2.71	3.47	4.22	4.97	5.72	6.47	7.22	7.98	8.73	9.48	10.23	10.98	11.73	12.48	13.24	13.99	14.74	15.49	16.24	16.99
63	-1.54	- .79	- .04	.71	1.46	2.22	2.97	3.72	4.47	5.22	5.97	6.73	7.48	8.23	8.98	9.73	10.48	11.23	11.99	12.74	13.49	14.24	14.99	15.74	16.49
62	-2.04	-1.29	- .54	.21	.97	1.72	2.47	3.22	3.97	4.72	5.48	6.23	6.98	7.73	8.48	9.23	9.98	10.74	11.49	12.24	12.99	13.74	14.49	15.24	16.00
61	-2.54	-1.79	-1.04	- .28	.47	1.22	1.97	2.72	3.47	4.23	4.98	5.73	6.48	7.23	7.98	8.73	9.49	10.24	10.99	11.74	12.49	13.24	13.99	14.75	15.50
60	-3.04	-2.29	-1.53	- .78	- .03	.72	1.47	2.22	2.98	3.73	4.48	5.23	5.98	6.73	7.48	8.24	8.99	9.74	10.49	11.24	11.99	12.74	13.50	14.25	15.00
59	-3.54	-2.78	-2.03	-1.28	- .53	.22	.97	1.73	2.48	3.23	3.98	4.73	5.48	6.23	6.99	7.74	8.49	9.24	9.99	10.74	11.49	12.25	13.00	13.75	14.50
58	-4.03	-3.28	-2.53	-1.78	-1.03	- .28	.48	1.23	1.98	2.73	3.48	4.23	4.98	5.74	6.49	7.24	7.99	8.74	9.49	10.24	11.00	11.75	12.50	13.25	14.00
57	-4.53	-3.78	-3.03	-2.28	-1.53	- .77	- .02	.73	1.48	2.23	2.98	3.73	4.49	5.24	5.99	6.74	7.49	8.24	8.99	9.75	10.50	11.25	12.00	12.75	13.50
56	-5.03	-4.28	-3.53	-2.78	-2.02	-1.27	- .52	.23	.98	1.73	2.48	3.24	3.99	4.74	5.49	6.24	6.99	7.74	8.50	9.25	10.00	10.75	11.50	12.25	13.00

Interpolation Table

Chest Circumference	Knee	
	0	.1
0	0	.376
.1	.050	.426
.2	.100	.475
.3	.150	.525
.4	.199	.575
.5	.249	.625
.6	.299	.675
.7	.349	.725
.8	.399	.775
.9	.449	.824

Table 80

Predicting Weight (Kilograms) of College Women From Height, Hips, Chest Circumference, and Knee (Centimeters) (.3165 height + .6508 hips + .8041 chest circumference + 3.6080 knee - 105.23)

Chest Circumference, Centimeters	Height																							
	140	142	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186
94	44.90	45.53	46.16	46.79	47.43	48.05	48.69	49.33	49.96	50.59	51.23	51.86	52.49	53.12	53.76	54.39	55.02	55.66	56.29	56.92	57.56	58.19	58.82	59.45
92	43.29	43.92	44.55	45.19	45.82	46.45	47.09	47.72	48.35	48.98	49.62	50.25	50.88	51.52	52.15	52.78	53.42	54.05	54.68	55.31	55.95	56.58	57.21	57.85
90	41.68	42.31	42.95	43.58	44.21	44.84	45.68	46.11	46.74	47.38	48.01	48.64	49.28	49.91	50.54	51.17	51.81	52.44	53.07	53.71	54.34	54.92	55.61	56.24
88	40.07	40.70	41.34	41.97	42.60	43.24	43.87	44.50	45.13	45.77	46.40	47.03	47.67	48.30	48.93	49.57	50.20	50.33	51.46	52.10	52.73	53.36	54.00	54.63
86	38.46	39.10	39.73	40.36	40.99	41.63	42.26	42.89	43.53	44.16	44.79	45.43	46.06	46.69	47.32	47.96	48.59	49.22	49.86	50.49	51.12	51.76	52.39	53.02
84	36.85	37.49	38.12	38.75	39.39	40.02	40.65	41.29	41.92	42.55	43.18	43.82	44.45	45.08	45.72	46.35	46.98	47.62	48.25	48.88	49.51	50.15	50.78	51.41
82	35.25	35.88	36.57	37.15	37.78	38.41	39.04	39.68	40.31	40.94	41.58	42.21	42.84	43.48	44.11	44.74	45.37	46.01	46.64	47.27	47.91	48.54	49.17	49.81
80	33.64	34.27	34.90	35.54	36.17	36.80	37.44	38.07	38.70	39.34	39.97	40.60	41.23	41.87	42.50	43.13	43.77	44.40	45.03	45.67	46.30	46.93	47.56	48.20
78	32.03	32.66	33.30	33.93	34.56	35.19	35.83	36.46	37.09	37.73	38.36	38.99	39.63	40.26	40.89	41.52	42.16	42.79	43.42	44.06	44.69	45.32	45.96	46.59
76	30.42	31.05	31.69	32.32	32.95	33.59	34.22	34.85	35.49	36.12	36.75	37.38	38.02	38.65	39.28	39.92	40.55	41.18	41.82	42.45	43.08	43.71	44.35	44.98
74	28.81	29.45	30.08	30.71	31.35	31.98	32.61	33.24	33.88	34.51	35.14	35.78	36.41	37.04	37.68	38.31	38.94	39.57	40.21	40.84	41.47	42.11	42.74	43.37
72	27.21	27.84	28.47	29.10	29.74	30.37	31.00	31.64	32.27	32.90	33.54	34.17	34.80	35.43	36.07	36.70	37.33	37.97	38.60	39.23	39.87	40.50	41.13	41.76
70	25.60	26.23	26.86	27.50	28.13	28.76	29.40	30.03	30.66	31.30	31.93	32.56	33.19	33.83	34.46	35.09	35.73	36.36	36.99	37.62	38.26	38.89	39.52	40.60
68	23.99	24.62	25.25	25.89	26.52	27.15	27.79	28.42	29.05	29.69	30.32	30.95	31.58	32.22	32.85	33.48	34.12	34.75	35.38	36.02	36.65	37.28	37.91	38.55
66	22.38	23.01	23.65	24.28	24.91	25.55	26.18	26.81	27.44	28.08	28.71	29.34	29.98	30.61	31.24	31.88	32.51	33.14	33.77	34.41	35.04	35.67	36.31	36.94
64	20.77	21.41	22.04	22.67	23.30	23.94	24.57	25.20	25.84	26.47	27.10	27.74	28.37	29.00	29.63	30.27	30.90	31.53	32.17	32.80	33.43	34.07	34.70	35.33
62	19.16	19.80	20.43	21.06	21.70	22.33	22.96	23.60	24.23	24.86	25.49	26.13	26.76	27.39	28.03	28.66	29.29	29.93	30.56	31.19	31.82	32.46	33.09	33.72
60	17.56	18.19	18.82	19.46	20.09	20.72	21.35	21.99	22.62	23.25	23.89	24.52	25.15	25.79	26.42	27.05	27.68	28.32	28.95	29.58	30.22	30.85	31.48	32.12
58	15.95	16.58	17.21	17.85	18.48	19.11	19.75	20.38	21.01	21.64	22.28	22.91	23.54	24.18	24.81	25.44	26.08	26.71	27.34	27.97	28.61	29.24	29.87	30.51
56	14.34	14.97	15.61	16.24	16.87	17.50	18.14	18.77	19.40	20.04	20.67	21.30	21.94	22.57	23.20	23.83	24.47	25.10	25.73	26.37	27.00	27.63	28.27	28.90
54	12.73	13.36	14.00	14.63	15.26	15.90	16.53	17.16	17.80	18.43	19.06	19.69	20.33	20.96	21.59	22.23	22.86	23.49	24.13	24.76	25.39	26.02	26.66	27.29
52	11.12	11.76	12.39	13.02	13.66	14.29	14.92	15.55	16.19	16.82	17.45	18.09	18.72	19.35	19.99	20.62	21.25	21.88	22.52	23.15	23.78	24.42	25.05	25.68
50	9.52	10.15	10.78	11.41	12.05	12.68	13.31	13.95	14.58	15.21	15.85	16.48	17.11	17.74	18.38	19.01	19.64	20.28	20.91	21.54	22.18	22.81	23.44	24.07
48	7.91	8.54	9.17	9.81	10.44	11.07	11.70	12.34	12.97	13.60	14.24	14.87	15.50	16.14	16.77	17.40	18.03	18.67	19.30	19.93	20.57	21.20	21.83	22.47

Interpolation Table

Chest Circumference	Height																			
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
0	0	.032	.063	.095	.127	.158	.190	.222	.253	.285	.317	.348	.380	.411	.443	.475	.506	.538	.570	.601
.1	.080	.112	.144	.175	.207	.239	.270	.302	.334	.365	.397	.429	.460	.492	.524	.555	.587	.618	.650	.682
.2	.161	.192	.224	.256	.287	.319	.351	.382	.414	.446	.477	.509	.541	.572	.604	.636	.667	.699	.731	.762
.3	.241	.273	.305	.336	.368	.399	.431	.463	.494	.526	.558	.589	.621	.653	.684	.716	.748	.779	.811	.843
.4	.322	.353	.385	.417	.448	.480	.512	.543	.575	.606	.638	.670	.701	.733	.765	.796	.828	.860	.891	.923
.5	.402	.434	.465	.497	.529	.560	.592	.624	.655	.687	.719	.750	.782	.814	.845	.877	.908	.940	.972	1.003
.6	.482	.514	.546	.577	.609	.641	.672	.704	.736	.767	.799	.831	.862	.894	.926	.957	.989	1.021	1.052	1.084
.7	.563	.595	.626	.658	.689	.721	.753	.784	.816	.848	.879	.911	.943	.974	1.006	1.038	1.069	1.101	1.133	1.164
.8	.643	.675	.707	.738	.770	.802	.833	.865	.896	.928	.960	.991	1.023	1.055	1.086	1.118	1.150	1.181	1.213	1.245
.9	.724	.755	.787	.819	.850	.882	.914	.945	.977	1.009	1.040	1.072	1.103	1.135	1.167	1.198	1.230	1.262	1.293	1.325
1.0	.804	.836	.867	.899	.931	.962	.994	1.026	1.057	1.089	1.121	1.152	1.184	1.216	1.247	1.279	1.311	1.342	1.374	1.405
1.1	.885	.916	.948	.979	1.011	1.043	1.074	1.106	1.138	1.169	1.201	1.233	1.264	1.296	1.328	1.359	1.391	1.423	1.454	1.486
1.2	.965	.997	1.028	1.060	1.092	1.123	1.155	1.186	1.218	1.250	1.281	1.313	1.345	1.376	1.408	1.440	1.471	1.503	1.535	1.566
1.3	1.045	1.077	1.109	1.140	1.172	1.204	1.235	1.267	1.299	1.330	1.362	1.393	1.425	1.457	1.488	1.520	1.552	1.583	1.615	1.647
1.4	1.126	1.157	1.189	1.221	1.252	1.284	1.316	1.347	1.379	1.411	1.442	1.474	1.506	1.537	1.569	1.600	1.632	1.664	1.695	1.727
1.5	1.206	1.238	1.269	1.301	1.333	1.364	1.396	1.428	1.459	1.491	1.523	1.554	1.586	1.618	1.649	1.681	1.713	1.744	1.776	1.808
1.6	1.287	1.318	1.350	1.382	1.413	1.445	1.476	1.508	1.540	1.571	1.603	1.635	1.666	1.698	1.730	1.761	1.793	1.825	1.856	1.888
1.7	1.367	1.399	1.430	1.462	1.494	1.525	1.557	1.589	1.620	1.652	1.683	1.715	1.747	1.778	1.810	1.842	1.873	1.905	1.937	1.968
1.8	1.447	1.479	1.511	1.542	1.574	1.606	1.637	1.669	1.701	1.732	1.764	1.796	1.827	1.859	1.890	1.922	1.954	1.985	2.017	2.049
1.9	1.528	1.559	1.591	1.623	1.654	1.686	1.718	1.749	1.781	1.813	1.844	1.876	1.908	1.939	1.971	2.003	2.034	2.066	2.097	2.129

Table 81

Predicting Weight (Kilograms) of College Women From Height, Hips, Chest Circumference, and Knee (Centimeters) (.3165 height + .6508 hips + .8041 chest circumference + 3.6080 knee - 105.23)

Knee	Hips																		
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
12.50	26.58	27.24	27.89	28.54	29.19	29.84	30.49	31.14	31.78	32.44	33.09	33.74	34.39	35.04	35.70	36.35	37.00	37.65	38.30
12.25	25.68	26.33	26.98	27.63	28.29	28.94	29.59	30.24	30.89	31.54	32.19	32.82	33.49	34.14	34.79	35.44	36.10	36.75	37.40
12.00	24.78	25.43	26.08	26.73	27.58	28.03	28.69	29.34	29.99	30.64	31.29	31.94	32.59	33.24	33.89	34.54	35.19	35.84	36.49
11.75	23.88	24.53	25.18	25.83	26.48	27.13	27.78	28.43	29.08	29.74	30.39	31.04	31.69	32.34	32.99	33.64	34.29	34.94	35.59
11.50	22.98	23.63	24.28	24.93	25.59	26.23	26.88	27.53	28.18	28.83	29.28	30.14	30.79	31.44	32.09	32.74	33.39	34.04	34.69
11.25	22.07	22.73	23.38	24.03	24.68	25.33	25.98	26.63	27.28	27.93	28.58	29.23	29.88	30.53	31.19	31.84	32.49	33.14	33.79
11.00	21.17	21.82	22.47	23.12	23.78	24.43	25.08	25.73	26.38	27.03	27.68	28.33	28.98	29.63	30.28	30.93	31.59	32.24	32.89
10.75	20.27	20.92	21.57	22.22	22.87	23.52	24.18	24.83	25.48	26.13	26.78	27.43	28.08	28.73	29.38	30.03	30.68	31.33	31.98
10.50	19.37	20.02	20.67	21.32	21.97	22.62	23.27	23.92	24.57	25.23	25.88	26.53	27.18	27.83	28.48	29.13	29.78	30.43	31.08
10.25	18.47	19.12	19.77	20.42	21.07	21.72	22.37	23.02	23.67	24.32	24.97	25.13	26.28	26.93	27.58	28.23	28.88	29.53	30.18
10.00	17.56	18.22	18.87	19.52	20.17	20.82	21.47	22.12	22.77	23.42	24.07	24.72	25.37	26.02	26.68	27.33	27.98	28.63	29.28
9.75	16.66	17.31	17.96	18.61	19.27	19.92	20.51	21.22	21.87	22.52	23.17	23.82	24.47	25.12	25.77	26.42	27.08	27.73	28.38
9.50	15.76	16.41	17.06	17.71	18.36	19.01	19.67	20.32	20.97	21.62	22.27	22.92	23.57	24.22	24.87	25.52	26.17	26.82	27.47
9.25	14.86	15.51	16.60	16.81	17.46	18.11	18.76	19.41	20.06	20.72	21.37	22.02	22.67	23.32	23.97	24.62	25.27	25.92	26.57
9.00	13.96	14.61	15.26	15.91	16.56	17.21	17.86	18.51	19.16	19.81	20.46	21.12	21.77	22.42	23.07	23.72	24.37	25.02	25.67
8.75	13.05	13.71	14.36	15.01	15.66	16.31	16.96	17.61	18.26	18.91	19.56	20.21	20.86	21.51	22.17	22.82	23.47	24.12	24.77
8.50	12.15	12.80	13.45	14.10	14.76	15.41	16.06	16.71	17.36	18.01	18.66	19.31	19.96	20.61	21.26	21.91	22.57	23.22	23.87
8.25	11.25	11.90	12.55	13.20	13.85	14.50	15.16	15.81	16.46	17.11	17.76	18.41	19.06	19.71	20.36	21.01	21.66	22.31	22.96
8.00	10.35	11.00	11.65	12.30	12.95	13.60	14.25	14.90	15.55	16.21	16.86	17.51	18.16	18.81	19.46	20.11	20.76	21.41	22.06
7.75	9.45	10.10	10.75	11.40	12.05	12.70	13.35	14.00	14.65	15.30	15.95	16.61	17.26	17.91	18.56	19.21	19.86	20.51	21.16
7.50	8.54	9.20	9.85	10.50	11.15	11.80	12.45	13.10	13.75	14.40	15.05	15.70	16.35	17.00	17.66	18.31	18.96	19.61	20.26
7.25	7.64	8.29	8.94	9.59	10.25	10.90	11.55	12.20	12.85	13.50	14.15	14.80	15.45	16.10	16.75	17.40	18.06	18.71	19.36
7.00	6.74	7.39	8.04	8.69	9.34	9.99	10.65	11.30	11.95	12.60	13.25	13.90	14.55	15.20	15.85	16.50	17.15	17.80	18.45
6.75	5.94	6.49	7.14	7.79	8.44	9.09	9.74	10.39	11.04	11.70	12.35	13.00	13.65	14.30	14.95	15.60	16.25	16.90	17.55
6.50	4.94	5.59	6.24	6.89	7.54	8.19	8.84	9.49	10.14	10.79	11.44	12.10	12.75	13.40	14.05	14.70	15.35	16.00	16.65

Interpolation Table

Knee	Hips									
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	0	.065	.130	.195	.260	.325	.390	.456	.521	.586
.1	.361	.426	.491	.556	.621	.686	.751	.816	.881	.947
.2	.722	.787	.852	.917	.982	1.047	1.112	1.177	1.242	1.307
.3	1.082	1.147	1.213	1.278	1.343	1.408	1.473	1.538	1.603	1.668
.4	1.443	1.508	1.573	1.638	1.704	1.769	1.834	1.899	1.964	2.029

Table 82

Norms for Upper Arm and Forearm of Four-Year-Old Boys (Upper arm = .0913 chest circumference + 1.8782 elbow + 2.7475; forearm = .0988 chest circumference + 1.8745 elbow + 2.5760)

Chest Circumference, Centimeters		Elbow Width, Centimeters															
		4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5
59.0	UA	15.65	15.83	16.02	16.21	16.40	16.59	16.77	16.96	17.15	17.34	17.53	17.71	17.90	18.09	18.28	18.46
	FA	15.90	16.09	16.28	16.47	16.65	16.84	17.03	17.22	17.40	17.59	17.78	17.97	18.15	18.34	18.53	18.71
58.5	UA	15.60	15.79	15.98	16.16	16.35	16.54	16.73	16.92	17.10	17.29	17.48	17.67	17.86	18.04	18.23	18.42
	FA	15.85	16.04	16.23	16.42	16.60	16.79	16.98	17.17	17.35	17.54	17.73	17.92	18.10	18.29	18.48	18.67
58.0	UA	15.56	15.74	15.93	16.12	16.31	16.49	16.68	16.87	17.06	17.25	17.43	17.62	17.81	18.00	18.19	18.37
	FA	15.80	15.99	16.18	16.37	16.55	16.74	16.93	17.12	17.30	17.49	17.68	17.87	18.05	18.24	18.43	18.62
57.5	UA	15.51	15.70	15.89	16.07	16.26	16.45	16.64	16.82	17.01	17.20	17.39	17.58	17.76	17.95	18.14	18.33
	FA	15.76	15.94	16.13	16.32	16.50	16.69	16.88	17.07	17.25	17.44	17.63	17.82	18.00	18.19	18.38	18.57
57.0	UA	15.46	15.65	15.84	16.03	16.22	16.40	16.59	16.78	16.97	17.15	17.34	17.53	17.72	17.91	18.09	18.28
	FA	15.71	15.89	16.08	16.27	16.46	16.64	16.83	17.02	17.21	17.39	17.58	17.77	17.96	18.14	18.33	18.52
56.5	UA	15.42	15.61	15.79	15.98	16.17	16.36	16.55	16.73	16.92	17.11	17.30	17.48	17.67	17.86	18.05	18.24
	FA	15.66	15.84	16.03	16.22	16.41	16.59	16.78	16.97	17.16	17.34	17.53	17.72	17.91	18.09	18.28	18.47
56.0	UA	15.37	15.56	15.75	15.94	16.12	16.31	16.50	16.69	16.88	17.06	17.25	17.44	17.63	17.81	18.00	18.19
	FA	15.61	15.79	15.98	16.17	16.36	16.54	16.73	16.92	17.11	17.29	17.48	17.67	17.86	18.04	18.23	18.42
55.5	UA	15.33	15.52	15.70	15.89	16.08	16.27	16.45	16.64	16.83	17.02	17.21	17.39	17.58	17.77	17.96	18.14
	FA	15.56	15.74	15.93	16.12	16.31	16.49	16.68	16.87	17.06	17.24	17.43	17.62	17.81	17.99	18.18	18.37
55.0	UA	15.28	15.47	15.66	15.85	16.03	16.22	16.41	16.60	16.78	16.97	17.16	17.35	17.54	17.72	17.91	18.10
	FA	15.51	15.70	15.88	16.07	16.26	16.45	16.63	16.82	17.01	17.20	17.38	17.57	17.76	17.94	18.13	18.32
54.5	UA	15.24	15.42	15.61	15.80	15.99	16.18	16.36	16.55	16.74	16.93	17.11	17.30	17.49	17.68	17.87	18.05
	FA	15.46	15.65	15.83	16.02	16.21	16.40	16.58	16.77	16.96	17.15	17.33	17.52	17.71	17.90	18.08	18.27
54.0	UA	15.19	15.38	15.57	15.75	15.94	16.13	16.32	16.51	16.69	16.88	17.07	17.26	17.44	17.63	17.82	18.01
	FA	15.41	15.60	15.78	15.97	16.16	16.35	16.53	16.72	16.91	17.10	17.28	17.47	17.66	17.85	18.03	18.22
53.5	UA	15.14	15.33	15.52	15.71	15.90	16.08	16.27	16.46	16.65	16.84	17.02	17.21	17.40	17.59	17.77	17.96
	FA	15.36	15.55	15.73	15.92	16.11	16.30	16.48	16.67	16.86	17.05	17.23	17.42	17.61	17.80	17.98	18.17
53.0	UA	15.10	15.29	15.47	15.66	15.85	16.04	16.23	16.41	16.60	16.79	16.98	17.17	17.35	17.54	17.73	17.92
	FA	15.31	15.50	15.69	15.87	16.06	16.25	16.44	16.62	16.81	17.00	17.18	17.37	17.56	17.75	17.93	18.12
52.5	UA	15.05	15.24	15.43	15.62	15.80	15.99	16.18	16.37	16.56	16.74	16.93	17.12	17.31	17.50	17.68	17.87
	FA	15.26	15.45	15.64	15.82	16.01	16.20	16.39	16.57	16.76	16.95	17.14	17.32	17.51	17.70	17.89	18.07
52.0	UA	15.01	15.20	15.38	15.57	15.76	15.95	16.13	16.32	16.51	16.70	16.89	17.07	17.26	17.45	17.64	17.83
	FA	15.21	15.40	15.59	15.77	15.96	16.15	16.34	16.52	16.71	16.90	17.09	17.27	17.46	17.65	17.84	18.02
51.5	UA	14.96	15.15	15.34	15.53	15.71	15.90	16.09	16.28	16.46	16.65	16.84	17.03	17.22	17.40	17.59	17.78
	FA	15.16	15.35	15.54	15.72	15.91	16.10	16.29	16.47	16.66	16.85	17.04	17.22	17.41	17.60	17.79	17.97
51.0	UA	14.92	15.10	15.29	15.48	15.67	15.86	16.04	16.23	16.42	16.61	16.79	16.98	17.17	17.36	17.55	17.73
	FA	15.11	15.30	15.49	15.68	15.86	16.05	16.24	16.42	16.61	16.80	16.99	17.17	17.36	17.55	17.74	17.92
50.5	UA	14.87	15.06	15.25	15.43	15.62	15.81	16.00	16.19	16.37	16.56	16.75	16.94	17.12	17.31	17.50	17.69
	FA	15.06	15.25	15.44	15.63	15.81	16.00	16.19	16.38	16.56	16.75	16.94	17.13	17.31	17.50	17.69	17.88
50.0	UA	14.83	15.01	15.20	15.39	15.58	15.76	15.95	16.14	16.33	16.52	16.70	16.89	17.08	17.27	17.45	17.64
	FA	15.01	15.20	15.39	15.58	15.76	15.95	16.14	16.33	16.51	16.70	16.89	17.08	17.26	17.45	17.64	17.83
49.5	UA	14.78	14.97	15.16	15.34	15.53	15.72	15.91	16.09	16.28	16.47	16.66	16.85	17.03	17.22	17.41	17.60
	FA	14.96	15.15	15.34	15.53	15.71	15.90	16.09	16.28	16.46	16.65	16.84	17.03	17.21	17.40	17.59	17.78
49.0	UA	14.73	14.92	15.11	15.30	15.49	15.67	15.86	16.05	16.24	16.42	16.61	16.80	16.99	17.18	17.36	17.55
	FA	14.92	15.10	15.29	15.48	15.67	15.85	16.04	16.23	16.41	16.60	16.79	16.98	17.16	17.35	17.54	17.73
48.5	UA	14.69	14.88	15.06	15.25	15.44	15.63	15.82	16.00	16.19	16.38	16.57	16.75	16.94	17.13	17.32	17.51
	FA	14.87	15.05	15.24	15.43	15.62	15.80	15.99	16.18	16.37	16.55	16.74	16.93	17.12	17.30	17.49	17.68
48.0	UA	14.64	14.83	15.02	15.21	15.39	15.58	15.77	15.96	16.15	16.33	16.52	16.71	16.90	17.08	17.27	17.46
	FA	14.82	15.00	15.19	15.38	15.57	15.75	15.94	16.13	16.32	16.50	16.69	16.88	17.07	17.25	17.44	17.63
47.5	UA	14.60	14.78	14.97	15.16	15.35	15.54	15.72	15.91	16.10	16.29	16.48	16.66	16.85	17.04	17.23	17.41
	FA	14.77	14.95	15.14	15.33	15.52	15.70	15.89	16.08	16.27	16.45	16.64	16.83	17.02	17.20	17.39	17.58
47.0	UA	14.55	14.74	14.93	15.11	15.30	15.49	15.68	15.87	16.05	16.24	16.43	16.62	16.81	16.99	17.18	17.37
	FA	14.72	14.91	15.09	15.28	15.47	15.65	15.84	16.03	16.22	16.40	16.59	16.78	16.97	17.15	17.34	17.53

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.009	.010
.2	.018	.020
.3	.027	.030
.4	.037	.040

Table 83

Norms for Thigh and Calf of Four-Year-Old Boys (Thigh = .3423 chest circumference + 2.1437 knee - 1.6094; calf = .1486 chest circumference + 1.8036 knee + .0738

Chest Circumference, Centimeters		Knee Width, Centimeters																			
		6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2
59.0	Th	32.09	32.31	32.52	32.73	32.95	33.16	33.38	33.59	33.81	34.02	34.24	34.45	34.66	34.88	35.09	35.31	35.52	35.74	35.95	36.16
	Ca	21.10	21.28	21.46	21.64	21.83	22.01	22.19	22.37	22.55	22.73	22.91	23.09	23.27	23.45	23.63	23.81	23.99	24.17	24.35	24.53
58.5	Th	31.92	32.13	32.35	32.56	32.78	32.99	33.21	33.42	33.64	33.85	34.06	34.28	34.49	34.71	34.92	35.14	35.35	35.56	35.78	35.99
	Ca	21.03	21.21	21.39	21.57	21.75	21.93	22.11	22.29	22.47	22.65	22.83	23.01	23.19	23.37	23.55	23.73	23.92	24.10	24.28	24.46
58.0	Th	31.75	31.96	32.18	32.39	32.61	32.82	33.04	33.25	33.46	33.68	33.89	34.11	34.32	34.54	34.75	34.96	35.18	35.39	35.61	35.82
	Ca	20.96	21.14	21.32	21.50	21.68	21.86	22.04	22.22	22.40	22.58	22.76	22.94	23.12	23.30	23.48	23.66	23.84	24.02	24.20	24.38
57.5	Th	31.58	31.79	32.01	32.22	32.44	32.65	32.86	33.08	33.29	33.51	33.72	33.94	34.15	34.36	34.58	34.79	35.01	35.22	35.44	35.65
	Ca	20.88	21.06	21.24	21.42	21.60	21.78	21.96	22.14	22.32	22.60	22.68	22.86	23.05	23.23	23.41	23.59	23.77	23.95	24.13	24.31
57.0	Th	31.41	31.62	31.84	32.05	32.26	32.48	32.69	32.91	33.12	33.34	33.55	33.77	33.98	34.19	34.41	34.62	34.84	35.05	35.27	35.48
	Ca	20.81	20.99	21.17	21.35	21.53	21.71	21.89	22.07	22.25	22.43	22.61	22.79	22.97	23.15	23.33	23.51	23.69	23.87	24.05	24.23
56.5	Th	31.24	31.45	31.66	31.88	32.09	32.31	32.52	32.74	32.95	33.17	33.38	33.59	33.81	34.02	34.24	34.45	34.67	34.88	35.09	35.31
	Ca	20.73	20.91	21.09	21.27	21.45	21.63	21.81	21.99	22.18	22.36	22.54	22.72	22.90	23.08	23.26	23.44	23.62	23.80	23.98	24.16
56.0	Th	31.06	31.28	31.49	31.71	31.92	32.14	32.35	32.57	32.78	32.99	33.21	33.42	33.64	33.85	34.07	34.28	34.49	34.71	34.92	35.14
	Ca	20.66	20.84	21.02	21.20	21.38	21.56	21.74	21.93	22.10	22.28	22.46	22.64	22.82	23.00	23.18	23.36	23.54	23.72	23.90	24.08
55.5	Th	30.89	31.11	31.32	31.54	31.75	31.97	32.18	32.39	32.61	32.82	33.04	33.25	33.47	33.68	33.89	34.11	34.32	34.54	34.75	34.97
	Ca	20.58	20.76	20.94	21.12	21.31	21.49	21.67	21.85	22.03	22.21	22.39	22.57	22.75	22.93	23.11	23.29	23.47	23.65	23.83	24.01
55.0	Th	30.72	30.94	31.15	31.37	31.58	31.79	32.01	32.22	32.44	32.65	32.87	33.08	33.29	33.51	33.72	33.94	34.15	34.37	34.58	34.80
	Ca	20.51	20.69	20.87	21.05	21.23	21.41	21.59	21.77	21.95	22.13	22.31	22.49	22.67	22.85	23.03	23.21	23.40	23.58	23.76	23.94
54.5	Th	30.55	30.77	30.98	31.19	31.41	31.62	31.84	32.05	32.27	32.48	32.69	32.91	33.12	33.34	33.55	33.77	33.98	34.20	34.41	34.62
	Ca	20.44	20.62	20.80	20.98	21.16	21.34	21.52	21.70	21.88	22.06	22.24	22.42	22.60	22.78	22.96	23.14	23.32	23.50	23.68	23.86
54.0	Th	30.38	30.59	30.81	31.02	31.24	31.45	31.67	31.88	32.10	32.31	32.52	32.74	32.95	33.17	33.38	33.60	33.81	34.02	34.24	34.45
	Ca	20.36	20.54	20.72	20.90	21.08	21.26	21.44	21.62	21.80	21.98	22.16	22.34	22.53	22.71	22.89	23.07	23.25	23.43	23.61	23.79
53.5	Th	30.21	30.42	30.64	30.85	31.07	31.28	31.50	31.71	31.92	32.14	32.35	32.57	32.78	33.00	33.21	33.42	33.64	33.85	34.07	34.28
	Ca	20.29	20.47	20.65	20.83	21.01	21.19	21.37	21.55	21.73	21.91	22.09	22.27	22.45	22.63	22.81	22.99	23.17	23.35	23.53	23.71
53.0	Th	30.04	30.25	30.47	30.68	30.90	31.11	31.32	31.54	31.75	31.97	32.18	32.40	32.61	32.82	33.04	33.25	33.47	33.68	33.90	34.11
	Ca	20.21	20.39	20.57	20.75	20.93	21.11	21.29	21.47	21.66	21.84	22.02	22.20	22.38	22.56	22.74	22.92	23.10	23.28	23.46	23.64
52.5	Th	29.87	30.08	30.30	30.51	30.72	30.94	31.15	31.37	31.58	31.80	32.01	32.22	32.44	32.65	32.87	33.08	33.30	33.51	33.73	33.94
	Ca	20.14	20.32	20.50	20.68	20.86	21.04	21.22	21.40	21.58	21.76	21.94	22.12	22.30	22.48	22.66	22.84	23.02	23.20	23.38	23.56
52.0	Th	29.70	29.91	30.12	30.34	30.55	30.77	30.98	31.20	31.41	31.62	31.84	32.05	32.27	32.48	32.70	32.91	33.13	33.34	33.55	33.77
	Ca	20.06	20.24	20.42	20.60	20.79	20.97	21.15	21.33	21.51	21.69	21.87	22.05	22.23	22.41	22.59	22.77	22.95	23.13	23.31	23.49
51.5	Th	29.52	29.74	29.95	30.17	30.38	30.60	30.81	31.02	31.24	31.45	31.67	31.88	32.10	32.31	32.53	32.74	32.95	33.17	33.38	33.60
	Ca	19.99	20.17	20.35	20.53	20.71	20.89	21.07	21.25	21.43	21.61	21.79	21.97	22.15	22.33	22.51	22.69	22.88	23.06	23.24	23.42
51.0	Th	29.35	29.57	29.78	30.00	30.21	30.43	30.64	30.85	31.07	31.28	31.50	31.71	31.93	32.14	32.35	32.57	32.78	33.00	33.21	33.43
	Ca	19.92	20.10	20.28	20.46	20.64	20.82	21.00	21.18	21.36	21.54	21.72	21.90	22.08	22.26	22.44	22.62	22.80	22.98	23.16	23.34
50.5	Th	29.18	29.40	29.61	29.83	30.04	30.25	30.47	30.68	30.90	31.11	31.33	31.54	31.75	31.97	32.18	32.40	32.61	32.83	33.04	33.26
	Ca	19.84	20.02	20.20	20.38	20.56	20.74	20.92	21.10	21.28	21.46	21.64	21.82	22.01	22.19	22.37	22.55	22.73	22.91	23.09	23.27
50.0	Th	29.01	29.23	29.44	29.65	29.87	30.08	30.30	30.51	30.73	30.94	31.15	31.37	31.58	31.80	32.01	32.23	32.44	32.66	32.87	33.08
	Ca	19.77	19.95	20.13	20.31	20.49	20.67	20.85	21.03	21.21	21.39	21.57	21.75	21.93	22.11	22.29	22.47	22.65	22.83	23.01	23.19
49.5	Th	28.84	29.05	29.27	29.48	29.70	29.91	30.13	30.34	30.55	30.77	30.98	31.20	31.41	31.63	31.84	32.06	32.27	32.48	32.70	32.91
	Ca	19.69	19.87	20.05	20.23	20.41	20.59	20.77	20.95	21.14	21.32	21.50	21.68	21.86	22.04	22.22	22.40	22.58	22.76	22.94	23.12
49.0	Th	28.67	28.88	29.10	29.31	29.53	29.74	29.95	30.17	30.38	30.60	30.81	31.03	31.24	31.46	31.67	31.88	32.10	32.31	32.53	32.74
	Ca	19.62	19.80	19.98	20.16	20.34	20.52	20.70	20.88	21.06	21.24	21.42	21.60	21.78	21.96	22.14	22.32	22.50	22.68	22.86	23.04
48.5	Th	28.50	28.71	28.93	29.14	29.35	29.57	29.78	30.00	30.21	30.43	30.64	30.86	31.07	31.28	31.50	31.71	31.93	32.14	32.36	32.57
	Ca	19.54	19.72	19.90	20.08	20.27	20.45	20.63	20.81	20.99	21.17	21.35	21.53	21.71	21.89	22.07	22.25	22.43	22.61	22.79	22.97
48.0	Th	28.33	28.54	28.76	28.97	29.18	29.40	29.61	29.83	30.04	30.26	30.47	30.68	30.90	31.11	31.33	31.54	31.76	31.97	32.18	32.40
	Ca	19.47	19.65	19.83	20.01	20.19	20.37	20.55	20.73	20.91	21.09	21.27	21.45	21.63	21.81	21.99	22.17	22.36	22.54	22.72	22.90
47.5	Th	28.16	28.37	28.58	28.80	29.01	29.23	29.44	29.66	29.87	30.08	30.30	30.51	30.73	30.94	31.16	31.37	31.59	31.80	32.01	32.23
	Ca	19.39	19.58	19.76	19.94	20.12	20.30	20.48	20.66	20.84	21.02	21.20	21.38	21.56	21.74	21.92	22.10	22.28	22.46	22.64	22.82
47.0	Th	27.98	28.20	28.41	28.63	28.84	29.06	29.27	29.48	29.70	29.91	30.13	30.34	30.56	30.77	30.99	31.20	31.41	31.63	31.84	32.06
	Ca	19.32	19.50	19.68	19.86	20.04	20.22	20.40	20.58	20.76	20.94	21.12	21.30	21.49	21.67	21.85	22.03	22.21	22.39	22.57	22.75

Interpolation Table

Chest Circumference	Knee	
	Thigh	Calf
	0	0
0	0	0
.1	.03	.01
.2	.07	.03
.3	.10	.04
.4	.14	.06

Table 84

Norms for Upper Arm and Forearm of Five-Year-Old Boys (Upper arm = .2056 chest circumference + 2.2433 elbow - 5.3476; forearm = .1444 chest circumference + 1.9487 elbow - .2357)

Chest Circumference, Centimeters		Elbow Width, Centimeters																
		4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6
63.0	UA	16.53	16.80	17.03	17.25	17.48	17.70	17.92	18.15	18.37	18.60	18.82	19.05	19.27	19.49	19.72	19.94	20.17
	FA	16.66	16.35	17.05	17.24	17.44	17.63	17.83	18.02	18.22	18.41	18.61	18.80	18.99	19.19	19.38	19.58	19.77
62.5	UA	16.49	16.70	16.92	17.15	17.37	17.60	17.82	18.05	18.27	18.49	18.72	18.94	19.17	19.39	19.62	19.84	20.06
	FA	16.58	16.78	16.97	17.17	17.36	17.56	17.75	17.95	18.14	18.34	18.53	18.73	18.92	19.12	19.31	19.51	19.70
62.0	UA	16.37	16.60	16.32	17.05	17.27	17.49	17.72	17.94	10.17	18.39	18.62	18.84	19.06	19.29	19.51	19.74	19.96
	FA	16.51	16.71	16.90	17.10	17.29	17.49	17.69	17.88	18.07	18.27	18.46	18.66	18.85	19.05	19.24	19.43	19.63
61.5	UA	16.27	16.49	16.72	16.94	17.17	17.39	17.62	17.84	18.06	18.29	18.51	18.74	18.96	19.19	19.41	19.63	19.86
	FA	16.44	16.63	16.33	17.02	17.22	17.41	17.61	17.80	18.00	18.19	18.39	18.59	18.78	18.97	19.17	19.36	19.56
61.0	UA	16.17	16.39	16.62	16.84	17.06	17.29	17.51	17.74	17.96	18.19	18.41	18.63	18.86	19.08	19.31	19.53	19.76
	FA	16.37	16.56	16.76	16.95	17.15	17.34	17.54	17.73	17.93	18.12	18.32	18.51	18.71	18.90	19.10	19.29	19.49
60.5	UA	16.06	16.29	16.51	16.74	16.96	17.19	17.41	17.63	17.86	18.08	18.31	18.53	18.76	18.98	19.21	19.43	19.65
	FA	16.30	16.49	16.69	16.88	17.07	17.27	17.46	17.66	17.85	18.05	18.24	18.44	18.63	18.83	19.02	19.22	19.41
60.0	UA	15.96	16.19	16.41	16.63	16.86	17.08	18.31	17.53	17.76	17.98	18.20	18.43	18.65	18.88	19.10	19.33	19.55
	FA	16.22	16.42	16.61	16.31	17.00	17.20	17.39	17.59	17.78	17.98	18.17	18.37	18.56	18.76	18.95	19.15	19.34
59.5	UA	15.36	16.08	16.31	16.53	16.76	16.98	17.20	17.43	17.65	17.88	18.10	18.33	18.55	18.78	19.00	19.22	19.45
	FA	16.15	16.35	16.54	16.74	16.93	17.13	17.32	17.51	17.71	17.90	18.10	18.29	18.49	18.68	18.88	19.07	19.27
59.0	UA	15.76	15.98	16.20	16.43	16.65	16.88	17.10	17.33	17.55	17.77	18.00	18.22	18.45	18.67	18.90	19.12	19.35
	FA	16.08	16.27	16.47	16.66	16.86	17.05	17.25	17.44	17.64	17.93	18.03	18.22	18.42	18.61	18.81	19.00	19.20
58.5	UA	15.65	15.88	16.10	16.33	16.55	16.77	17.00	17.22	17.45	17.67	17.90	18.12	18.35	18.57	18.79	19.02	19.24
	FA	16.01	16.20	16.40	16.59	16.79	16.98	17.18	17.37	17.57	17.76	17.96	18.15	18.34	18.54	18.73	18.93	19.12
58.0	UA	15.55	15.77	16.00	16.22	16.45	16.67	16.90	17.12	17.35	17.57	17.79	18.02	18.24	18.47	18.69	18.92	19.14
	FA	15.93	16.13	16.32	16.52	16.71	16.91	17.10	17.30	17.49	17.69	17.88	18.08	18.27	18.47	18.66	18.86	19.05
57.5	UA	15.45	15.67	15.90	16.12	16.34	16.57	16.79	17.02	17.24	17.47	17.69	17.92	18.14	18.36	18.59	18.81	19.04
	FA	15.36	16.06	16.25	16.45	16.64	16.34	17.03	17.23	17.42	17.62	17.31	18.01	18.20	18.40	18.59	18.79	18.98
57.0	UA	15.34	15.57	15.79	16.02	16.24	16.47	16.69	16.92	17.14	17.36	17.59	17.81	18.04	18.26	18.49	18.71	18.93
	FA	15.79	15.98	16.18	16.37	16.57	16.76	16.96	17.15	17.35	17.54	17.74	17.93	18.13	18.32	18.52	18.71	18.91
56.5	UA	15.24	15.47	15.69	15.91	16.14	16.36	16.59	16.81	17.04	17.26	17.49	17.71	17.93	18.16	18.38	18.61	18.83
	FA	15.72	15.91	16.11	16.30	16.50	16.69	16.89	17.08	17.28	17.47	17.67	17.86	18.06	18.25	18.45	18.64	18.84
56.0	UA	15.14	15.36	15.59	15.81	16.04	16.26	16.49	16.71	16.93	17.16	17.38	17.61	17.83	18.06	18.28	18.50	18.73
	FA	15.65	15.84	16.04	16.23	16.42	16.62	16.81	17.01	17.20	17.40	17.59	17.79	17.98	18.18	18.37	18.57	18.76
55.5	UA	15.04	15.26	15.49	15.71	15.93	16.16	16.38	16.61	16.83	17.06	17.28	17.50	17.73	17.95	18.18	18.40	18.63
	FA	15.57	15.77	15.96	16.16	16.35	16.55	16.74	16.94	17.13	17.33	17.52	17.72	17.91	18.11	18.30	18.50	18.69
55.0	UA	14.93	15.16	15.38	15.61	15.83	16.06	16.28	16.50	16.73	16.95	17.18	17.40	17.63	17.85	18.07	18.30	18.52
	FA	15.50	15.70	15.89	16.09	16.28	16.48	16.67	16.87	17.06	17.25	17.45	17.64	17.84	18.03	18.23	18.42	18.62
54.5	UA	14.83	15.06	15.28	15.50	15.73	15.95	16.18	16.40	16.63	16.85	17.07	17.30	17.52	17.75	17.97	18.20	18.42
	FA	15.43	15.52	15.82	16.01	16.21	16.40	16.60	16.79	16.99	17.18	17.38	17.57	17.77	17.96	18.16	18.35	18.55
54.0	UA	14.73	14.95	15.18	15.40	15.63	15.85	16.07	16.30	16.52	16.75	16.97	17.20	17.42	17.64	17.87	18.09	18.32
	FA	15.36	15.55	15.75	15.94	16.14	16.33	16.53	16.72	16.92	17.11	17.31	17.50	17.70	17.89	18.08	18.28	18.47
53.5	UA	14.63	14.85	15.07	15.30	15.52	15.75	15.97	16.20	16.42	16.64	16.87	17.09	17.32	17.54	17.77	17.99	18.21
	FA	15.28	15.48	15.67	15.87	16.06	16.26	16.45	16.65	16.84	17.04	17.23	17.43	17.62	17.82	18.01	18.21	18.40
53.0	UA	14.52	14.75	14.97	15.20	15.42	15.64	15.87	16.09	16.32	16.54	16.77	16.99	17.21	17.44	17.66	17.89	18.11
	FA	15.21	15.41	15.60	15.80	15.99	16.19	16.38	16.58	16.77	16.97	17.16	17.36	17.55	17.75	17.94	18.14	18.33
52.5	UA	14.42	14.64	14.87	15.09	15.32	15.54	15.77	15.99	16.21	16.44	16.66	16.89	17.11	17.34	17.56	17.78	18.01
	FA	15.14	15.33	15.53	15.72	15.92	16.11	16.31	16.50	16.70	16.89	17.09	17.28	17.48	17.67	17.87	18.06	18.26
52.0	UA	14.32	14.54	14.77	14.99	15.21	15.44	15.66	15.89	16.11	16.34	16.56	16.78	17.01	17.23	17.46	17.68	17.91
	FA	15.07	15.26	15.46	15.65	15.85	16.04	16.24	16.43	16.63	16.82	17.02	17.21	17.41	17.60	17.80	17.99	18.19
51.5	UA	14.21	14.44	14.66	14.89	15.11	15.34	15.56	15.78	16.01	16.23	16.46	16.68	16.91	17.13	17.35	17.58	17.80
	FA	15.00	15.19	15.39	15.58	15.78	15.97	16.16	16.36	16.55	16.75	16.94	17.14	17.33	17.53	17.72	17.92	18.11
51.0	UA	14.11	14.34	14.56	14.78	15.01	15.23	15.46	15.68	15.91	16.13	16.35	16.58	16.80	17.03	17.25	17.48	17.70
	FA	14.92	15.12	15.31	15.51	15.70	15.90	16.09	16.29	16.48	16.68	16.87	17.07	17.26	17.46	17.65	17.85	18.04
50.5	UA	14.01	14.23	14.46	14.68	14.91	15.13	15.35	15.58	15.80	16.03	16.25	16.48	16.70	16.92	17.15	17.37	17.60
	FA	14.95	15.05	15.24	15.44	15.63	15.83	16.02	16.22	16.41	16.61	16.80	16.99	17.19	17.38	17.58	17.77	17.97
50.0	UA	13.91	14.13	14.35	14.58	14.30	15.03	15.25	15.48	15.70	15.92	16.15	16.37	16.60	16.82	17.05	17.27	17.49
	FA	14.78	14.97	15.17	15.36	15.56	15.75	15.95	16.14	16.34	16.53	16.73	16.92	17.12	17.31	17.51	17.70	17.90
49.5	UA	13.80	14.03	14.25	14.48	14.70	14.92	15.15	15.37	15.60	15.82	16.05	16.27	16.49	16.72	16.94	17.17	17.39
	FA	14.71	14.90	15.10	15.29	15.49	15.68	15.88	16.07	16.27	16.46	16.66	16.85	17.05	17.24	17.44	17.63	17.82
49.0	UA	13.70	13.92	14.15	14.37	14.60	14.82	15.05	15.27	15.49	15.72	15.94	16.17	16.39	16.62	16.84	17.06	17.29
	FA	14.63	14.83	15.02	15.22	15.41	15.61	15.80	16.00	16.19	16.39	16.58	16.78	16.97	17.17	17.36	17.56	17.75
48.5	UA	13.60	13.82	14.05	14.27	14.49	14.72	14.94	15.17	15.39	15.62	15.84	16.06	16.29	16.51	16.74	16.96	17.19
	FA	14.56	14.76	14.95	15.15	15.34	15.54	15.73	15.93	16.12	16.32	16.51	16.71	16.90	17.10	17.29	17.49	17.68
48.0	UA	13.49	13.72	13.94	14.17	14.39	14.62	14.84	15.06	15.29	15.51	15.74	15.96	16.19	16.41	16.64	16.86	17.08
	FA	14.49	14.69	14.88	15.07	15.27	15.46	15.66	15.85	16.05	16.24	16.44	16.63	16.83	17.02	17.22	17.41	17.61
47.5	UA	13.39	13.62	13.84	14.06	14.29	14.51	14.74	14.96	15.19	15.41	15.63	15.86	16.08	16.31	16.53	16.76	16.98
	FA	14.42	14.61	14.81	15.00	15.20	16.39	15.59	15.78	15.98	16.17	16.37	16.56	16.76	16.95	17.15	17.34	17.54

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.021	.014
.2	.041	.029
.3	.062	.043
.4	.082	.058

Table 85.

Norms for Thigh and Calf of Five-Year-Old Boys (Thigh = .3715 chest circumference + 3.3645 knee - 12.1928; calf = .2611 chest circumference + 1.4904 knee - 2.5966)

Chest Circumference, Centimeters		Knee Width, Centimeters																							
		6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5
63.0	Th	32.07	32.41	32.74	33.08	33.42	33.75	34.09	34.43	34.76	35.10	35.44	35.77	36.11	36.45	36.78	37.12	37.46	37.79	38.13	38.46	38.80	39.14	39.47	39.81
	Ca	23.09	23.24	23.39	23.54	23.69	23.84	23.99	24.14	24.29	24.43	24.58	24.73	24.88	25.03	25.18	25.33	25.48	25.63	25.78	25.92	26.07	26.22	26.37	26.52
62.5	Th	31.89	32.22	32.56	32.90	33.23	33.57	33.90	34.24	34.58	34.91	35.25	35.59	35.92	36.26	36.60	36.93	37.27	37.61	37.94	38.28	38.61	38.95	39.29	39.62
	Ca	22.96	23.11	23.26	23.41	23.56	23.71	23.86	24.01	24.15	24.30	24.45	24.60	24.75	24.90	25.05	25.20	25.35	25.50	25.65	25.79	25.94	26.09	26.24	26.39
62.0	Th	31.70	32.04	32.37	32.71	33.05	33.38	33.72	34.06	34.39	34.73	35.06	35.40	35.74	36.07	36.41	36.75	37.08	37.42	37.76	38.09	38.43	38.77	39.10	39.44
	Ca	22.83	22.98	23.13	23.28	23.43	23.58	23.73	23.88	24.02	24.17	24.32	24.47	24.62	24.77	24.92	25.07	25.22	25.37	25.51	25.66	25.81	25.96	26.11	26.26
61.5	Th	31.51	31.85	32.19	32.52	32.86	33.20	33.53	33.87	34.21	34.54	34.88	35.22	35.55	35.89	36.22	36.56	36.90	37.23	37.57	37.91	38.24	38.58	38.92	39.25
	Ca	22.70	22.85	23.00	23.15	23.30	23.45	23.60	23.74	23.89	24.04	24.19	24.34	24.49	24.64	24.79	24.94	25.09	25.24	25.38	25.53	25.68	25.83	25.98	26.13
61.0	Th	31.33	31.67	32.00	32.34	32.67	33.01	33.35	33.68	34.02	34.36	34.69	35.03	35.37	35.70	36.04	36.38	36.71	37.05	37.38	37.72	38.06	38.39	38.73	39.07
	Ca	22.57	22.72	22.87	23.02	23.17	23.32	23.47	23.61	23.76	23.91	24.06	24.21	24.36	24.51	24.66	24.81	24.96	25.10	25.25	25.40	25.55	25.70	25.85	26.00
60.5	Th	31.14	31.48	31.82	32.15	32.49	32.83	33.16	33.50	33.83	34.17	34.51	34.84	35.18	35.52	35.85	36.19	36.53	36.86	37.20	37.54	37.87	38.21	38.54	38.88
	Ca	22.44	22.59	22.74	22.89	23.04	23.19	23.33	23.48	23.63	23.78	23.93	24.08	24.23	24.38	24.53	24.68	24.83	24.97	25.12	25.27	25.42	25.57	25.72	25.87
60.0	Th	30.96	31.29	31.63	31.97	32.30	32.64	32.98	33.31	33.65	33.99	34.32	34.66	34.99	35.33	35.67	36.00	36.34	36.68	37.01	37.35	37.69	38.02	38.36	38.70
	Ca	22.31	22.46	22.61	22.76	22.91	23.06	23.20	23.35	23.50	23.65	23.80	23.95	24.10	24.25	24.40	24.55	24.69	24.84	24.99	25.14	25.29	25.44	25.59	25.74
59.5	Th	30.77	31.11	31.44	31.78	32.12	32.45	32.79	33.13	33.46	33.80	34.14	34.47	34.81	35.15	35.48	35.82	36.15	36.49	36.83	37.16	37.50	37.84	38.17	38.51
	Ca	22.18	22.33	22.48	22.63	22.78	22.92	23.07	23.22	23.37	23.52	23.67	23.82	23.97	24.12	24.27	24.41	24.56	24.71	24.86	25.01	25.16	25.31	25.46	25.61
59.0	Th	30.59	30.92	31.26	31.59	31.93	32.27	32.60	32.94	33.28	33.61	33.95	34.29	34.62	34.96	35.30	35.63	35.97	36.31	36.64	36.98	37.31	37.65	37.99	38.32
	Ca	22.05	22.20	22.35	22.50	22.64	22.79	22.94	23.09	23.24	23.39	23.54	23.69	23.84	23.99	24.14	24.28	24.43	24.58	24.73	24.88	25.03	25.18	25.33	25.48
58.5	Th	30.40	30.74	31.07	31.41	31.74	32.08	32.42	32.76	33.09	33.43	33.76	34.10	34.44	34.77	35.11	35.45	35.78	36.12	36.46	36.79	37.13	37.47	37.80	38.14
	Ca	21.92	22.07	22.22	22.37	22.51	22.66	22.81	22.96	23.11	23.26	23.41	23.56	23.71	23.86	24.00	24.15	24.30	24.45	24.60	24.75	24.90	25.05	25.20	25.35
58.0	Th	30.21	30.55	30.89	31.22	31.56	31.90	32.23	32.57	32.91	33.24	33.58	33.92	34.25	34.59	34.92	35.26	35.60	35.93	36.27	36.61	36.94	37.28	37.62	37.95
	Ca	21.79	21.94	22.09	22.23	22.38	22.53	22.68	22.83	22.98	23.13	23.28	23.43	23.58	23.73	23.87	24.02	24.17	24.32	24.47	24.62	24.77	24.92	25.07	25.22
57.5	Th	30.03	30.36	30.70	31.04	31.37	31.71	32.05	32.38	32.72	33.06	33.39	33.73	34.07	34.40	34.74	35.08	35.41	35.75	36.08	36.42	36.76	37.09	37.43	37.77
	Ca	21.66	21.81	21.96	22.10	22.25	22.40	22.55	22.70	22.85	23.00	23.15	23.30	23.45	23.59	23.74	23.89	24.04	24.19	24.34	24.49	24.64	24.79	24.94	25.09
57.0	Th	29.84	30.18	30.52	30.85	31.19	31.52	31.86	32.20	32.53	32.87	33.21	33.54	33.88	34.22	34.55	34.89	35.23	35.56	35.90	36.24	36.57	36.91	37.24	37.58
	Ca	21.53	21.68	21.82	21.97	22.12	22.27	22.42	22.57	22.72	22.87	23.02	23.17	23.32	23.46	23.61	23.76	23.91	24.06	24.21	24.36	24.51	24.66	24.81	24.95
56.5	Th	29.66	29.99	30.33	30.67	31.00	31.34	31.68	32.01	32.35	32.68	33.02	33.36	33.69	34.03	34.37	34.70	35.04	35.38	35.71	36.05	36.39	36.72	37.06	37.40
	Ca	21.40	21.55	21.69	21.84	21.99	22.14	22.29	22.44	22.59	22.74	22.89	23.04	23.18	23.33	23.48	23.63	23.78	23.93	24.08	24.23	24.38	24.53	24.67	24.82
56.0	Th	29.47	29.81	30.14	30.48	30.82	31.15	31.49	31.83	32.16	32.50	32.84	33.17	33.51	33.84	34.18	34.52	34.85	35.19	35.53	35.86	36.20	36.54	36.87	37.21
	Ca	21.27	21.41	21.56	21.71	21.86	22.01	22.16	22.31	22.46	22.61	22.76	22.90	23.05	23.20	23.35	23.50	23.65	23.80	23.95	24.10	24.25	24.40	24.54	24.69
55.5	Th	29.29	29.62	29.96	30.29	30.63	30.97	31.30	31.64	31.98	32.31	32.65	32.99	33.32	33.66	34.00	34.33	34.67	35.01	35.34	35.68	36.01	36.35	36.69	37.02
	Ca	21.13	21.28	21.43	21.58	21.73	21.88	22.03	22.18	22.33	22.48	22.63	22.77	22.92	23.07	23.22	23.37	23.52	23.67	23.82	23.97	24.12	24.26	24.41	24.56
55.0	Th	29.10	29.44	29.77	30.11	30.45	30.78	31.12	31.45	31.79	32.13	32.46	32.80	33.14	33.47	33.81	34.15	34.48	34.82	35.16	35.49	35.83	36.17	36.50	36.84
	Ca	21.00	21.15	21.30	21.45	21.60	21.75	21.90	22.05	22.20	22.35	22.49	22.64	22.79	22.94	23.09	23.24	23.39	23.54	23.69	23.84	23.99	24.13	24.28	24.43
54.4	Th	28.91	29.25	29.59	29.92	30.26	30.60	30.93	31.27	31.61	31.94	32.28	32.61	32.95	33.29	33.62	33.96	34.30	34.63	34.97	35.31	35.64	35.98	36.32	36.65
	Ca	20.87	21.02	21.17	21.32	21.47	21.62	21.77	21.92	22.07	22.22	22.36	22.51	22.66	22.81	22.96	23.11	23.26	23.41	23.56	23.71	23.85	24.00	24.15	24.30
54.0	Th	28.73	29.06	29.40	29.74	30.07	30.41	30.75	31.08	31.42	31.76	32.09	32.43	32.77	33.10	33.44	33.77	34.11	34.45	34.78	35.12	35.46	35.79	36.13	36.47
	Ca	20.74	20.89	21.04	21.19	21.34	21.49	21.64	21.79	21.94	22.08	22.23	22.38	22.53	22.68	22.83	22.98	23.13	23.28	23.43	23.58	23.72	23.87	24.02	24.17
53.5	Th	28.54	28.88	29.22	29.55	29.89	30.22	30.56	30.90	31.23	31.57	31.91	32.24	32.58	32.92	33.25	33.59	33.93	34.26	34.60	34.93	35.27	35.61	35.94	36.28
	Ca	20.61	20.76	20.91	21.06	21.21	21.36	21.51	21.66	21.81	21.95	22.10	22.25	22.40	22.55	22.70	22.85	23.00	23.15	23.30	23.44	23.59	23.74	23.89	24.04
53.0	Th	28.36	28.69	29.03	29.37	29.70	30.04	30.38	30.71	31.05	31.38	31.72	32.06	32.39	32.73	33.07	33.40	33.74	34.08	34.41	34.75	35.09	35.42	35.76	36.09
	Ca	20.48	20.63	20.78	20.93	21.08	21.23	21.38	21.53	21.67	21.82	21.97	22.12	22.27	22.42	22.57	22.72	22.87	23.02	23.16	23.31	23.46	23.61	23.76	23.91
52.5	Th	28.17	28.51	28.84	29.18	29.52	29.85	30.19	30.53	30.86	31.20	31.54	31.87	32.21	32.54	32.88	33.22	33.55	33.89	34.23	34.56	34.90	35.24	35.57	35.91
	Ca	20.35	20.50	20.65	20.80	20.95	21.10	21.25	21.39	21.54	21.69	21.84	21.99	22.14	22.29	22.44	22.59	22.74	22.89	23.03	23.18	23.33	23.48	23.63	23.78
52.0	Th	27.99	28.32	28.66	28.99	29.33	29.67	30.00	30.34	30.68	31.01	31.35	31.69	32.02	32.36	32.70	33.03	33.37	33.70	34.04	34.38	34.71	35.05	35.39	35.72
	Ca	20.22	20.37	20.52	20.67	20.82	20.97	21.12	21.26	21.41	21.56	21.71	21.86	22.01	22.16	22.31	22.46	22.61	22.75	22.90	23.05	23.20	23.35	23.50	23.65
51.5	Th	27.80	28.14	28.47	28.81	29.15	29.48	29.82	30.15	30.49	30.83	31.16	31.50	31.84	32.17	32.51	32.85	33.18	33.52	33.86	34.19	34.53	34.86	35.20	35.54
	Ca	20.09	20.24	20.39	20.54	20.69	20.84	20.98	21.13	21.28	21.43	21.58	21.73	21.88	22.03	22.18	22.33	22.48	22.62	22.77	22.92	23.07	23.22	23.37	23.52
51.0	Th	27.61	27.95	28.29	28.62	28.96	29.30	29.63	29.97	30.31	30.64	30.98	31.31	31.65	31.99	32.32	32.66	33.00	33.33	33.67	34.01	34.34	34.68	35.02	35.35
	Ca	19.96	20.11	20.26	20.41	20.56	20.71	20.85	21.00	21.15	21.30	21.45	21.60	21.75	21.90	22.05	22.20	22.34	22.49	22.64	22.79	22.94	23.09	23.24	23.39
50.5	Th	27.43	27.76	28.10	28.44	28.77	29.11	29.45	29.78	30.12	30.46	30.79	31.13	31.47	31.80	32.14	32.47	32.81	33.15	33.48	33.82	34.16	34.49	34.83	35.17
	Ca	19.83	19.98	20.13	20.28	20.43	20.57	20.72	20.87	21.02	21.17	21.32	21.47	21.62	21.77	21.92	22.07	22.21	22.36	22.51	22.66	22.81	22.96	23.11	23.26
50.0	Th	27.24	27.58	27.92	28.25	28.59	28.92	29.26	29.60	29.93	30.27	30.61	30.94	31.28	31.62	31.95	32.29	32.63	32.96	33.30	33.63	33.97	34.31	34.64	34.98
	Ca	19.70	19.85	20.00	20.15	20.30	20.44	20.59	20.74	20.89	21.04	21.19	21.34	21.49	21.64	21.79	21.93	22.08	22.23	22.38	22.53	22.68	22.83	22.98	23.13
49.5	Th	27.06	27.39	27.73	28.07	28.40	28.74	29.08	29.41	29.75	30.08	30.42	30.76	31.09	31.43	31.77	32.10	32.44	32.78	33.11	33.45	33.79	34.12	34.46	34.79
	Ca	19.57	19.72	19.87	20.02	20.16	20.31	20.46	20.61	20.76	20.91	21.06	21.21	21.36	21.51	21.65	21.80	21.95	22.10	22.25	22.40	22.55	22.70	22.85	23.00
49.0	Th	26.87	27.21	27.54	27.88	28.22	28.55	28.89	29.23	29.56	29.90	30.24	30.57	30.91	31.24	31.58	31.92	32.25	32.59	32.93	33.26	33.60	33.94	34.27	34.61
	Ca	19.44	19.59	19.74	19.88	20.03	20.18	20.33	20.48	20.63	20.78	20.93	21.08	21.23	21.38	21.52	21.67	21.82	21.97	22.12	22.27	22.42	22.57	22.72	22.87
48.5	Th	26.68	27.02	27.36	27.69	28.03	28.37	28.70	29.04	29.38	29.71	30.05	30.39	30.72	31.06	31.40	31.73	32.07	32.40	32.74	33.08	33.41	33.75	34.09	34.42
	Ca	19.31	19.46	19.61	19.75	19.90	20.05	20.20	20.35	20.50	20.65	20.80	20.95	21.10	21.24	21.39	21.54	21.69	21.84	21.99	22.14	22.29	22.44	22.59	22.74
48.0	Th	26.50	26.84	27.17	27.51	27.84	28.18	28.52	28.85	29.19	29.53	29.86	30.20	30.54	30.87	31.21	31.55	31.88	32.22	32.56	32.89	33.23	33.56	33.90	34.24
	Ca	19.18	19.33	19.47	19.62	19.77	19.92	20.07	20.22	20.37	20.52	20.67	20.82	20.97	21.11	21.26	21.41	21.56	21.71	21.86	22.01	22.16	22.31	22.46	22.60
47.5	Th	26.31	26.65	26.99	27.32	27.66	28.00	28.33	28.67	29.00	29.34	29.68	30.01	30.35	30.69	31.02	31.36	31.70	32.03	32.37	32.71	33.04	33.38	33.72	34.05
	Ca	19.05	19.20	19.34	19.49	19.64	19.79	19.94	20.09	20.24	20.39	20.54	20.69	20.83	20.98	21.13	21.28	21.43	21.58	21.73	21.88	22.03	22.18	22.33	22.47

Interpolation Table

Chest Circumference	Thigh	Calf
	0	0
0	0	0
.1	.037	.026
.2	.074	.052
.3	.111	.078
.4	.149	.104

Table 86

Norms for Upper Arm and Forearm for Six-Year-Old Boys (Upper arm = .3890 chest circumference + 1.3297 elbow - 11.2247; forearm = .2582 chest circumference + 1.4657 elbow - 4.3205)

Chest Circumference, Centimeters		Elbow Width, Centimeters																		
		4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9
66	UA	19.90	20.03	20.17	20.30	20.43	20.57	20.70	20.83	20.96	21.10	21.23	21.36	21.50	21.63	21.76	21.90	22.03	22.16	22.29
	FA	18.73	18.88	19.02	19.17	19.32	19.46	19.61	19.76	19.90	20.05	20.20	20.34	20.49	20.64	20.78	20.93	21.08	21.22	21.37
65	UA	19.51	19.65	19.78	19.91	20.04	20.18	20.31	20.44	20.58	20.71	20.84	20.97	21.11	21.24	21.37	21.51	21.64	21.77	21.91
	FA	18.47	18.62	18.77	18.91	19.06	19.20	19.35	19.50	19.64	19.79	19.94	20.08	20.23	20.38	20.52	20.67	20.82	20.96	21.11
64	UA	19.12	19.26	19.39	19.52	19.65	19.79	19.92	20.05	20.19	20.32	20.45	20.59	20.72	20.85	20.98	21.12	21.25	21.38	21.52
	FA	18.21	18.36	18.51	18.65	18.80	18.95	19.09	19.24	19.39	19.53	19.68	19.83	19.97	20.12	20.27	20.41	20.56	20.71	20.85
63	UA	18.73	18.87	19.00	19.13	19.27	19.40	19.53	19.66	19.80	19.93	20.06	20.20	20.33	20.46	20.60	20.73	20.86	20.99	21.13
	FA	17.96	18.10	18.25	18.40	18.54	18.69	18.83	18.98	19.13	19.27	19.42	19.57	19.71	19.86	20.01	20.15	20.30	20.45	20.59
62	UA	18.35	18.48	18.61	18.74	18.88	19.01	19.14	19.28	19.41	19.54	19.67	19.81	19.94	20.07	20.21	20.34	20.47	20.61	20.74
	FA	17.70	17.84	17.99	18.14	18.28	18.43	18.58	18.72	18.87	19.02	19.16	19.31	19.46	19.60	19.75	19.90	20.04	20.19	20.34
61	UA	17.96	18.09	18.22	18.35	18.49	18.62	18.75	18.89	19.02	19.15	19.29	19.42	19.55	19.68	19.82	19.95	20.08	20.22	20.35
	FA	17.44	17.59	17.73	17.88	18.03	18.17	18.32	18.47	18.61	18.76	18.90	19.05	19.20	19.34	19.49	19.64	19.78	19.93	20.08
60	UA	17.57	17.70	17.83	17.97	18.10	18.23	18.36	18.50	18.63	18.76	18.90	19.03	19.16	19.30	19.43	19.56	19.69	19.83	19.96
	FA	17.18	17.33	17.47	17.62	17.77	17.91	18.06	18.21	18.35	18.50	18.65	18.79	18.94	19.09	19.23	19.38	19.53	19.67	19.82
59	UA	17.18	17.31	17.44	17.58	17.71	17.84	17.98	18.11	18.24	18.37	18.51	18.64	18.77	18.91	19.04	19.17	19.31	19.44	19.57
	FA	16.92	17.07	17.22	17.36	17.51	17.66	17.80	17.95	18.10	18.24	18.39	18.53	18.68	18.83	18.97	19.12	19.27	19.41	19.56
58	UA	16.79	16.92	17.06	17.19	17.32	17.45	17.59	17.72	17.85	17.99	18.12	18.25	18.38	18.52	18.65	18.78	18.92	19.05	19.18
	FA	16.66	16.81	16.96	17.10	17.25	17.40	17.54	17.69	17.84	17.98	18.13	18.28	18.42	18.57	18.72	18.86	19.01	19.16	19.30
57	UA	16.40	16.53	16.67	16.80	16.93	17.06	17.20	17.33	17.46	17.60	17.73	17.86	18.00	18.13	18.26	18.39	18.53	18.66	18.79
	FA	16.41	16.55	16.70	16.85	16.99	17.14	17.29	17.43	17.58	17.73	17.87	18.02	18.17	18.31	18.46	18.60	18.75	18.90	19.04
56	UA	16.01	16.14	16.28	16.41	16.54	16.68	16.81	16.94	17.07	17.21	17.34	17.47	17.61	17.74	17.87	18.01	18.14	18.27	18.40
	FA	16.15	16.29	16.44	16.59	16.73	16.88	17.03	17.17	17.32	17.47	17.61	17.76	17.91	18.05	18.20	18.35	18.49	18.64	18.79
55	UA	15.62	15.76	15.89	16.02	16.15	16.29	16.42	16.55	16.69	16.82	16.95	17.08	17.22	17.35	17.48	17.62	17.75	17.88	18.02
	FA	15.89	16.04	16.18	16.33	16.48	16.62	16.77	16.92	17.06	17.21	17.36	17.50	17.65	17.80	17.94	18.09	18.23	18.38	18.53
54	UA	15.23	15.37	15.50	15.63	15.76	15.90	16.03	16.16	16.30	16.43	16.56	16.70	16.83	16.96	17.09	17.23	17.36	17.49	17.63
	FA	15.63	15.78	15.92	16.07	16.22	16.36	16.51	16.66	16.80	16.95	17.10	17.24	17.39	17.54	17.68	17.83	17.98	18.12	18.27
53	UA	14.84	14.98	15.11	15.24	15.38	15.51	15.64	15.77	15.91	16.04	16.17	16.31	16.44	16.57	16.71	16.84	16.97	17.10	17.24
	FA	15.37	15.52	15.67	15.81	15.96	16.11	16.25	16.40	16.55	16.69	16.84	16.99	17.13	17.28	17.43	17.57	17.72	17.87	18.01
52	UA	14.46	14.59	14.72	14.85	14.99	15.12	15.25	15.39	15.52	15.65	15.78	15.92	16.05	16.18	16.32	16.45	16.58	16.72	16.85
	FA	15.12	15.26	15.41	15.55	15.70	15.85	15.99	16.14	16.29	16.43	16.58	16.73	16.87	17.02	17.17	17.31	17.46	17.61	17.75
51	UA	14.07	14.20	14.33	14.46	14.60	14.73	14.86	15.00	15.13	15.26	15.40	15.53	15.66	15.79	15.93	16.06	16.19	16.33	16.46
	FA	14.86	15.00	15.15	15.30	15.44	15.59	15.74	15.88	16.03	16.18	16.32	16.47	16.62	16.76	16.91	17.06	17.20	17.35	17.50
50	UA	13.68	13.81	13.94	14.08	14.21	14.34	14.47	14.61	14.74	14.87	15.01	15.14	15.27	15.41	15.54	15.67	15.80	15.94	16.07
	FA	14.60	14.75	14.89	15.04	15.19	15.33	15.48	15.62	15.77	15.92	16.06	16.21	16.36	16.50	16.65	16.80	16.94	17.09	17.24
49	UA	13.29	13.42	13.55	13.69	13.82	13.95	14.09	14.22	14.35	14.48	14.62	14.75	14.88	15.02	15.15	15.28	15.42	15.55	15.68
	FA	14.34	14.49	14.63	14.78	14.93	15.07	15.22	15.37	15.51	15.66	15.81	15.95	16.10	16.25	16.39	16.54	16.69	16.83	16.98

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.039	.026
.2	.078	.052
.3	.117	.077
.4	.156	.103
.5	.195	.129
.6	.233	.155
.7	.272	.181
.8	.311	.207
.9	.350	.232

Table 87

Norms for Thigh and Calf of Six-Year-Old Boys (Thigh = .7062 chest circumference + 1.8968 knee - 19.8172; calf = .4023 chest circumference + 1.3576 knee - 9.3413)

Chest Circumference, Centimeters		Knee Width, Centimeters																				
		6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5
66	Th	39.12	39.31	39.50	39.69	39.88	40.07	40.26	40.45	40.64	40.83	41.02	41.21	41.40	41.59	41.78	41.97	42.16	42.35	42.54	42.73	42.91
	Ca	26.03	26.17	26.31	26.44	26.58	26.71	26.85	26.99	27.12	27.26	27.39	27.53	27.66	27.80	27.94	28.07	28.21	28.34	28.48	28.61	28.75
65	Th	38.42	38.60	38.79	38.98	39.17	39.36	39.55	39.74	39.93	40.12	40.31	40.50	40.69	40.88	41.07	41.26	41.45	41.64	41.83	42.02	42.21
	Ca	25.63	25.77	25.90	26.04	26.18	26.31	26.45	26.58	26.72	26.85	26.99	27.13	27.26	27.40	27.53	27.67	27.80	27.94	28.08	28.21	28.35
64	Th	37.71	37.90	38.09	38.28	38.47	38.66	38.85	39.04	39.23	39.42	39.61	39.80	39.98	40.17	40.36	40.55	40.74	40.93	41.12	41.31	41.50
	Ca	25.23	25.37	25.50	25.64	25.77	25.91	26.04	26.18	26.32	26.45	26.59	26.72	26.86	27.00	27.13	27.27	27.40	27.54	27.67	27.81	27.95
63	Th	37.00	37.19	37.38	37.57	37.76	37.95	38.14	38.33	38.52	38.71	38.90	39.09	39.28	39.47	39.66	39.85	40.04	40.23	40.42	40.61	40.80
	Ca	24.83	24.96	25.10	25.24	25.37	25.51	25.64	25.78	25.91	26.05	26.19	26.32	26.46	26.59	26.73	26.86	27.00	27.14	27.27	27.41	27.54
62	Th	36.30	36.49	36.68	36.87	37.06	37.24	37.43	37.62	37.81	38.00	38.19	38.38	38.57	38.76	38.95	39.14	39.33	39.52	39.71	39.90	40.09
	Ca	24.43	24.56	24.70	24.83	24.97	25.10	25.24	25.38	25.51	25.65	25.78	25.92	26.05	26.19	26.33	26.46	26.60	26.73	26.87	27.01	27.14
61	Th	35.59	35.78	35.97	36.16	36.35	36.54	36.73	36.92	37.11	37.30	37.49	37.68	37.87	38.06	38.25	38.44	38.63	38.81	39.00	39.19	39.38
	Ca	24.02	24.16	24.29	24.43	24.57	24.70	24.84	24.97	25.11	25.25	25.38	25.52	25.65	25.79	25.92	26.06	26.20	26.33	26.47	26.60	26.74
60	Th	34.88	35.07	35.26	35.45	35.64	35.83	36.02	36.21	36.40	36.59	36.78	36.97	37.16	37.35	37.54	37.73	37.92	38.11	38.30	38.49	38.68
	Ca	23.62	23.76	23.89	24.03	24.16	24.30	24.44	24.57	24.71	24.84	24.98	25.11	25.25	25.39	25.52	25.66	25.79	25.93	26.06	26.20	26.34
59	Th	34.18	34.37	34.56	34.75	34.94	35.13	35.32	35.51	35.70	35.88	36.07	36.26	36.45	36.64	36.83	37.02	37.21	37.40	37.59	37.78	37.97
	Ca	23.22	23.35	23.49	23.63	[illegible]	23.90	24.03	24.17	24.30	24.44	24.58	24.71	24.85	24.98	25.12	25.26	25.39	25.53	25.66	25.80	25.93
58	Th	33.47	33.66	33.85	34.04	34.23	34.42	34.61	34.80	34.99	35.18	35.37	35.56	35.75	35.94	36.13	36.32	36.51	36.70	36.89	37.08	37.27
	Ca	22.82	22.95	23.09	23.22	23.36	23.50	23.63	23.77	23.90	24.04	24.17	24.31	24.45	24.58	24.72	24.85	24.99	25.12	25.26	25.40	25.53
57	Th	32.77	32.96	33.14	33.33	33.52	33.71	33.90	34.09	34.28	34.47	34.66	34.85	35.04	35.23	35.42	35.51	35.80	35.99	36.18	36.37	36.56
	Ca	22.41	22.55	22.69	22.82	22.96	23.09	23.23	23.36	23.50	23.64	23.77	23.91	24.04	24.18	24.31	24.45	24.59	24.72	24.86	24.99	25.13
56	Th	32.06	32.25	32.44	32.63	32.82	33.01	33.20	33.39	33.58	33.77	33.96	34.15	34.34	34.53	34.71	34.90	35.09	35.28	35.47	35.66	35.85
	Ca	22.01	22.15	22.28	22.42	22.55	22.69	22.83	22.96	23.10	23.23	23.37	23.51	23.64	23.78	23.91	24.05	24.18	24.32	24.46	24.59	24.73
55	Th	31.35	31.54	31.73	31.92	32.11	32.30	32.49	32.68	32.87	33.06	33.25	33.44	33.63	33.82	34.01	34.20	34.39	34.58	34.77	34.96	35.15
	Ca	21.61	21.75	21.88	22.02	22.15	22.29	22.42	22.56	22.70	22.83	22.97	23.10	23.24	23.37	23.51	23.65	23.78	23.92	24.05	24.19	24.32
54	Th	30.65	30.84	31.03	31.22	31.41	31.60	31.78	31.97	32.16	32.35	32.54	32.73	32.92	33.11	33.30	33.49	33.68	33.87	34.06	34.25	34.44
	Ca	21.21	21.34	21.48	21.61	21.75	21.89	22.02	22.16	22.29	22.43	22.56	22.70	22.84	22.97	23.11	23.24	23.38	23.52	23.65	23.79	23.92
53	Th	29.94	30.13	30.32	30.51	30.70	30.89	31.08	31.27	31.46	31.65	31.84	32.03	32.22	32.41	32.60	32.79	32.98	33.17	33.35	33.54	33.73
	Ca	20.81	20.94	21.08	21.21	21.35	21.48	21.62	21.76	21.89	22.03	22.16	22.30	22.43	22.57	22.71	22.84	22.98	23.11	23.25	23.38	23.52
52	Th	29.23	29.42	29.61	29.80	29.99	30.18	30.37	30.56	30.75	30.94	31.13	31.32	31.51	31.70	31.89	32.08	32.27	32.46	32.65	32.84	33.03
	Ca	20.40	20.54	20.67	20.81	20.95	21.08	21.22	21.35	21.49	21.62	21.76	21.90	22.03	22.17	22.30	22.44	22.57	22.71	22.85	22.98	23.12
51	Th	28.53	28.72	28.91	29.10	29.29	29.48	29.67	29.86	30.05	30.24	30.43	30.61	30.80	30.99	31.18	31.37	31.56	31.75	31.94	32.13	32.32
	Ca	20.00	20.14	20.27	20.41	20.54	20.68	20.81	20.95	21.09	21.22	21.36	21.49	21.63	21.77	21.90	22.04	22.17	22.31	22.44	22.58	22.72
50	Th	27.82	28.01	28.20	28.39	28.58	28.77	28.96	29.15	29.34	29.53	29.72	29.91	30.10	30.29	30.48	30.67	30.86	31.05	31.24	31.43	31.62
	Ca	19.60	19.73	19.87	20.01	20.14	20.28	20.41	20.55	20.68	20.82	20.96	21.09	21.23	21.36	21.50	21.53	21.77	21.91	22.04	22.18	22.31
49	Th	27.12	27.31	27.50	27.68	27.87	28.06	28.25	28.44	28.63	28.92	29.01	29.20	29.39	29.58	29.77	29.96	30.15	30.34	30.53	30.72	30.91
	Ca	19.20	19.33	19.47	19.60	19.74	19.87	20.01	20.15	20.28	20.42	20.55	20.69	20.82	20.96	21.10	21.23	21.37	21.50	21.64	21.78	21.91

Interpolation Table

Chest Circumference	Knee	
	Thigh	Calf
	0	0
0	0	0
.1	.071	.040
.2	.141	.080
.3	.212	.121
.4	.282	.161
.5	.353	.201
.6	.424	.241
.7	.494	.282
.8	.565	.322
.9	.636	.362

Table 68

Norms for Upper Arm and Forearm of Seven-Year-Old Boys (Upper arm = .2959 chest circumference + 1.7270 elbow - 8.3651; forearm = .2018 chest circumference + 1.4395 elbow - 1.0581)

Chest Circumference, Centimeters		Elbow Width, Centimeters																			
		4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1
68	UA	19.01	19.18	19.35	19.53	19.70	19.87	20.05	20.22	20.39	20.56	20.74	20.91	21.08	21.25	21.43	21.60	21.77	21.95	22.11	22.29
	FA	18.71	18.85	19.00	19.14	19.29	19.43	19.57	19.72	19.86	20.01	20.15	20.29	20.44	20.58	20.73	20.87	21.01	21.16	21.30	21.45
67	UA	18.71	18.89	19.06	19.23	19.40	19.58	19.75	19.92	20.10	20.27	20.44	20.61	20.79	20.96	21.13	21.30	21.48	21.65	21.82	21.99
	FA	18.51	18.65	18.80	18.94	19.08	19.23	19.37	19.52	19.66	19.80	19.95	20.10	20.24	20.38	20.52	20.67	20.81	20.96	21.10	21.24
66	UA	18.42	18.59	18.76	18.94	19.11	19.28	19.45	19.63	19.80	19.97	20.14	20.32	20.49	20.66	20.84	21.01	21.18	21.35	21.53	21.70
	FA	18.31	18.45	18.59	18.74	18.88	19.03	19.17	19.31	19.46	19.60	19.75	19.89	20.03	20.18	20.32	20.47	20.61	20.75	20.90	21.04
65	UA	18.12	18.29	18.47	18.64	18.81	18.99	19.16	19.33	19.50	19.68	19.85	20.02	20.19	20.37	20.54	20.71	20.87	21.06	21.23	21.40
	FA	18.10	18.25	18.39	18.54	18.68	18.82	18.97	19.11	19.26	19.40	19.54	19.69	19.83	19.98	20.12	20.26	20.41	20.55	20.70	20.84
64	UA	17.83	18.00	18.17	18.34	18.52	18.69	18.86	19.03	19.21	19.38	19.55	19.73	19.90	20.07	20.24	20.42	20.59	20.76	20.93	21.11
	FA	17.90	18.05	18.19	18.33	18.48	18.62	18.77	18.91	19.05	19.20	19.34	19.49	19.63	19.77	19.92	20.06	20.21	20.35	20.49	20.64
63	UA	17.53	17.70	17.88	18.05	18.22	18.39	18.57	18.74	18.91	19.08	19.26	19.43	19.60	19.78	19.95	20.12	20.29	20.47	20.64	20.81
	FA	17.70	17.85	17.99	18.13	18.28	18.42	18.57	18.71	18.85	19.00	19.14	19.28	19.43	19.57	19.72	19.86	20.00	20.14	20.29	20.44
62	UA	17.24	17.41	17.58	17.75	17.92	18.10	18.27	18.49	18.62	18.79	18.96	19.13	19.31	19.48	19.65	19.82	20.00	20.17	20.34	20.52
	FA	17.50	17.64	17.79	17.93	18.08	18.22	18.36	18.51	18.65	18.79	18.94	19.08	19.23	19.37	19.51	19.66	19.80	19.95	20.09	20.23
61	UA	16.94	17.11	17.28	17.46	17.63	17.80	17.98	18.15	18.32	18.49	18.67	18.84	19.01	19.18	19.36	19.53	19.70	19.88	20.05	20.22
	FA	17.30	17.44	17.59	17.73	17.87	18.02	18.16	18.31	18.45	18.59	18.74	18.88	19.03	19.17	19.31	19.46	19.60	19.74	19.89	20.03
60	UA	16.64	16.82	16.99	17.16	17.33	17.51	17.68	17.85	18.02	18.20	18.37	18.54	18.71	18.89	19.06	19.23	19.41	19.58	19.75	19.92
	FA	17.10	17.24	17.38	17.53	17.67	17.82	17.96	18.10	18.25	18.39	18.53	18.68	18.82	18.97	19.11	19.26	19.40	19.54	19.69	19.83
59	UA	16.35	16.52	16.69	16.87	17.04	17.21	17.38	17.56	17.73	17.90	18.07	18.25	18.42	18.59	18.77	18.94	19.11	19.28	19.46	19.63
	FA	16.89	17.04	17.18	17.33	17.47	17.61	17.76	17.90	18.05	18.19	18.33	18.48	18.62	18.77	18.91	19.05	19.20	19.34	19.49	19.63
58	UA	16.05	16.22	16.40	16.57	16.74	16.92	17.09	17.26	17.43	17.61	17.78	17.95	18.12	18.30	18.47	18.64	18.81	18.99	19.16	19.33
	FA	16.69	16.84	16.98	17.12	17.27	17.41	17.56	17.70	17.84	17.99	18.13	18.28	18.42	18.56	18.71	18.85	19.00	19.14	19.28	19.43
57	UA	15.76	15.93	16.10	16.27	16.45	16.62	16.79	16.96	17.14	17.31	17.48	17.66	17.83	18.00	18.17	18.35	18.52	18.69	18.86	19.04
	FA	16.49	16.63	16.77	16.92	17.07	17.21	17.35	17.50	17.64	17.79	17.93	18.07	18.22	18.36	18.51	18.65	18.79	18.94	19.08	19.23
56	UA	15.46	15.63	15.81	15.98	16.15	16.32	16.50	16.67	16.84	17.01	17.19	17.36	17.53	17.70	17.88	18.05	18.22	18.40	18.57	18.74
	FA	16.29	16.43	16.58	16.72	16.86	17.01	17.15	17.30	17.44	17.58	17.73	17.87	18.02	18.16	18.30	18.45	18.59	18.74	18.88	19.02
55	UA	15.16	15.34	15.51	15.68	15.85	16.02	16.20	16.37	16.55	16.72	16.89	17.06	17.24	17.40	17.58	17.75	17.92	18.10	18.27	18.44
	FA	16.09	16.23	16.37	16.52	16.66	16.81	16.95	17.09	17.24	17.38	17.53	17.67	17.81	17.96	18.10	18.25	18.39	18.53	18.67	18.82
54	UA	14.87	15.04	15.21	15.39	15.56	15.73	15.90	16.08	16.25	16.42	16.59	16.77	16.94	17.11	17.28	17.46	17.63	17.80	17.98	18.15
	FA	15.89	16.03	16.17	16.32	16.46	16.60	16.74	16.89	17.04	17.18	17.32	17.47	17.61	17.76	17.90	18.04	18.19	18.33	18.48	18.62
53	UA	14.57	14.74	14.92	15.09	15.26	15.43	15.61	15.78	15.95	16.13	16.30	16.47	16.64	16.82	16.99	17.16	17.33	17.51	17.68	17.85
	FA	15.68	15.83	15.97	16.12	16.26	16.40	16.55	16.69	16.83	16.98	17.12	17.27	17.41	17.55	17.70	17.84	17.99	18.13	18.27	18.42
52	UA	14.28	14.45	14.62	14.79	14.97	15.14	15.31	15.48	15.66	15.83	16.00	16.17	16.35	16.52	16.69	16.87	17.04	17.21	17.38	17.56
	FA	15.48	15.63	15.76	15.91	16.06	16.20	16.35	16.49	16.63	16.78	16.92	17.06	17.21	17.35	17.50	17.64	17.78	17.93	18.07	18.22
51	UA	13.98	14.15	14.32	14.50	14.67	14.84	15.02	15.19	15.36	15.53	15.71	15.88	16.05	16.22	16.40	16.57	16.74	16.92	17.09	17.26
	FA	15.28	15.42	15.57	15.71	15.86	16.00	16.14	16.29	16.43	16.58	16.72	16.86	17.01	17.15	17.29	17.44	17.58	17.73	17.87	18.01
50	UA	13.68	13.86	14.03	14.20	14.37	14.55	14.72	14.89	15.06	15.24	15.41	15.58	15.76	15.93	16.10	16.27	16.45	16.62	16.79	16.96
	FA	15.08	15.22	15.37	15.51	15.65	15.80	15.94	16.09	16.23	16.37	16.52	16.66	16.81	16.95	17.09	17.24	17.38	17.52	17.67	17.81

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.030	.020
.2	.059	.040
.3	.089	.061
.4	.118	.081
.5	.148	.101
.6	.178	.121
.7	.207	.141
.8	.237	.161
.9	.266	.182

Table 89

Norms for Thigh and Calf of Seven-Year-Old Boys (Thigh = .5604 chest circumference + 2.1808 knee - 14.9098; calf = .2625 chest circumference + 1.6951 knee - 3.7227)

Chest Circumference, Centimeters		Knee Width, Centimeters														
		6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2
68	Th	38.51	38.95	39.39	39.82	40.26	40.70	41.13	41.57	42.00	42.44	42.88	43.31	43.75	44.18	44.62
	Ca	24.98	25.31	25.65	25.99	26.33	26.67	27.01	27.35	27.69	28.03	28.37	28.71	29.04	29.38	29.72
67	Th	37.93	38.37	38.81	39.24	39.68	40.11	40.55	40.99	41.43	41.86	42.30	42.73	43.17	43.60	44.04
	Ca	24.71	25.05	25.39	25.73	26.07	26.41	26.75	27.09	27.43	27.76	28.10	28.44	28.78	29.12	29.46
66	Th	37.35	37.79	38.23	38.66	39.10	39.53	39.97	40.41	40.84	41.28	41.72	42.15	42.59	43.02	43.46
	Ca	24.45	24.79	25.13	25.47	25.81	26.15	26.49	26.82	27.16	27.50	27.84	28.18	28.52	28.86	29.20
65	Th	36.77	37.21	37.65	38.08	38.52	38.95	39.39	39.82	40.26	40.70	41.13	41.57	42.00	42.44	42.88
	Ca	24.19	24.53	24.87	25.21	25.54	25.88	26.22	26.56	26.90	27.24	27.58	27.92	28.26	28.60	28.93
64	Th	36.19	36.63	37.07	37.50	37.94	38.37	38.80	39.25	39.68	40.11	40.55	40.99	41.43	41.86	42.30
	Ca	23.93	24.26	24.60	24.94	25.28	25.62	25.96	26.30	26.64	26.98	27.32	27.66	27.99	28.33	28.67
63	Th	35.61	36.05	36.48	36.92	37.36	37.79	38.23	38.67	39.10	39.54	39.97	40.41	40.85	41.28	41.72
	Ca	23.66	24.00	24.34	24.68	25.02	25.36	25.70	26.04	26.38	26.71	27.05	27.39	27.73	28.07	28.41
62	Th	35.03	35.47	35.90	36.34	36.78	37.21	37.65	38.09	38.52	38.96	39.39	39.83	40.27	40.70	41.14
	Ca	23.40	23.74	24.08	24.42	24.76	25.09	25.44	25.77	26.11	26.45	26.79	27.13	27.47	27.80	28.15
61	Th	34.45	34.89	35.32	35.76	36.20	36.63	37.07	37.50	37.94	38.38	38.81	39.25	39.69	40.12	40.56
	Ca	23.14	23.48	23.82	24.16	24.49	24.83	25.17	25.51	25.85	26.19	26.53	26.82	27.21	27.55	27.88
60	Th	33.87	34.31	34.74	35.18	35.62	36.05	36.49	36.92	37.36	37.80	38.23	38.67	39.11	39.54	39.98
	Ca	22.88	23.21	23.55	23.89	24.23	24.57	24.91	25.25	25.59	25.93	26.27	26.61	26.94	27.28	27.62
59	Th	33.29	33.73	34.16	34.60	35.04	35.47	35.91	36.34	36.78	37.22	37.65	38.09	38.52	38.96	39.40
	Ca	22.61	22.95	23.29	23.63	23.97	24.30	24.65	24.99	25.33	25.66	26.00	26.34	26.68	27.02	27.36
58	Th	32.71	33.15	33.58	34.02	34.46	34.89	35.33	35.76	36.20	36.64	37.07	37.51	37.94	38.38	38.82
	Ca	22.35	22.69	23.03	23.37	23.71	24.05	24.39	24.72	25.06	25.40	25.74	26.08	26.42	26.76	27.10
57	Th	32.13	32.57	33.00	33.44	33.87	34.31	34.75	35.18	35.62	36.06	36.49	36.93	37.36	37.80	38.24
	Ca	22.09	22.43	22.77	23.11	23.44	23.78	24.12	24.46	24.80	25.14	25.48	25.82	26.16	26.50	26.83
56	Th	31.55	31.99	32.42	32.86	33.29	33.73	34.17	34.60	35.04	35.48	35.91	36.35	36.78	37.22	37.66
	Ca	21.83	22.16	22.50	22.84	23.18	23.52	23.86	24.20	24.54	24.88	25.22	25.56	25.89	26.23	26.57
55	Th	30.97	31.41	31.84	32.28	32.71	33.15	33.59	34.02	34.46	34.89	35.33	35.77	36.20	36.64	37.08
	Ca	21.56	21.90	22.24	22.58	22.92	23.26	23.60	23.94	24.28	24.61	24.95	25.29	25.63	25.97	26.31
54	Th	30.39	30.83	31.26	31.70	32.13	32.57	33.00	33.44	33.88	34.31	34.75	35.19	35.62	36.06	36.50
	Ca	21.30	21.63	21.78	22.32	22.66	23.00	23.34	23.67	24.01	24.35	24.69	25.03	25.37	25.71	26.05
53	Th	29.81	30.24	30.68	31.12	31.55	31.99	32.43	32.86	33.30	33.73	34.17	34.61	35.04	35.48	35.91
	Ca	21.04	21.38	21.71	22.06	22.39	22.73	23.07	23.41	23.75	24.09	24.43	24.77	25.11	25.45	25.78
52	Th	29.23	29.66	30.10	30.54	30.97	31.41	31.85	32.28	32.72	33.15	33.59	34.03	34.46	34.90	35.33
	Ca	20.78	21.11	21.45	21.79	22.13	22.47	22.81	23.15	23.49	23.83	24.17	24.51	24.84	25.18	25.52
51	Th	28.65	29.08	29.52	29.96	30.39	30.83	31.26	31.70	32.14	32.57	33.01	33.45	33.88	34.32	34.75
	Ca	20.51	20.84	21.19	21.53	21.86	22.20	22.54	22.88	23.22	23.56	23.90	24.24	24.58	24.92	25.26
50	Th	28.07	28.50	28.94	29.38	29.81	30.25	30.68	31.12	31.56	31.99	32.43	32.87	33.30	33.74	34.17
	Ca	20.25	20.59	20.93	21.27	21.61	21.95	22.28	22.62	22.96	23.30	23.64	23.98	24.32	24.66	25.00

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.218	0	.170
.1	.058	.276	.026	.196
.2	.116	.334	.053	.222
.3	.174	.392	.079	.248
.4	.232	.450	.105	.275
.5	.290	.508	.131	.301
.6	.348	.566	.158	.327
.7	.406	.624	.184	.353
.8	.464	.682	.210	.380
.9	.522	.740	.236	.486

Table 90

Norms for Upper Arm and Forearm of Eight-Year-Old Boys (Upper arm = .3500 chest circumference + 1.5283 elbow - 10.9097; forearm = .2335 chest circumference + 1.4945 elbow - 3.2988)

Chest Circumference, Centimeters		Elbow Width, Centimeters																				
		4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2.	6.3
69	UA	19.81	19.96	20.12	20.27	20.42	20.58	20.73	20.88	21.03	21.19	21.34	21.49	21.65	21.80	21.95	22.10	22.26	22.41	22.56	22.72	22.87
	FA	19.24	19.39	19.54	19.69	19.84	19.99	20.14	20.29	20.43	20.58	20.73	20.88	21.03	21.18	21.33	21.48	21.63	21.78	21.93	22.08	22.23
68	UA	19.46	19.61	19.77	19.92	20.07	20.23	20.38	20.53	20.68	20.84	20.99	21.14	21.30	21.45	21.60	21.75	21.91	22.06	22.21	22.37	22.52
	FA	19.01	19.16	19.30	19.45	19.60	19.75	19.90	20.05	20.20	20.35	20.50	20.65	20.80	20.95	21.10	21.25	21.40	21.55	21.70	21.85	21.99
67	UA	19.11	19.26	19.42	19.57	19.72	19.88	20.03	20.18	20.33	20.49	20.64	20.79	20.95	21.10	21.25	21.40	21.56	21.71	21.86	22.02	22.17
	FA	18.77	18.92	19.07	19.22	19.37	19.52	19.67	19.82	19.97	20.12	20.27	20.42	20.57	20.71	20.86	21.01	21.16	21.31	21.46	21.61	21.76
66	UA	18.76	18.91	19.07	19.22	19.37	19.53	19.68	19.83	19.98	20.14	20.29	20.44	20.60	20.75	20.90	21.05	21.21	21.36	21.51	21.67	21.82
	FA	18.54	18.69	18.84	18.99	19.14	19.29	19.44	19.58	19.73	19.88	20.03	20.18	20.33	20.48	20.63	20.78	20.93	21.08	21.23	21.38	21.53
65	UA	18.41	18.56	18.72	18.87	19.02	19.18	19.33	19.48	19.63	19.79	19.94	20.09	20.25	20.40	20.55	20.70	20.86	21.01	21.16	21.32	21.47
	FA	18.31	18.45	18.60	18.75	18.90	19.05	19.20	19.35	19.50	19.65	19.80	19.95	20.10	20.25	20.40	20.55	20.70	20.85	21.00	21.14	21.29
64	UA	18.06	18.21	18.37	18.52	18.67	18.83	18.98	19.13	19.28	19.44	19.59	19.74	19.90	20.05	20.20	20.35	20.51	20.66	20.81	20.97	21.12
	FA	18.07	18.22	18.37	18.52	18.67	18.82	18.97	19.12	19.27	19.42	19.57	19.72	19.86	20.01	20.16	20.31	20.46	20.61	20.76	20.91	21.06
63	UA	17.71	17.86	18.02	18.17	18.32	18.48	18.63	18.78	18.93	19.09	19.24	19.39	19.55	19.70	19.85	20.00	20.16	20.31	20.46	20.62	20.77
	FA	17.84	17.99	18.14	18.29	18.44	18.59	18.73	18.88	19.03	19.18	19.33	19.48	19.63	19.78	19.93	20.08	20.23	20.38	20.53	20.68	20.83
62	UA	17.36	17.51	17.67	17.82	17.97	18.13	18.28	18.43	18.58	18.74	18.69	19.04	19.20	19.35	19.50	19.65	19.81	19.96	20.11	20.27	20.42
	FA	17.60	17.75	17.90	18.05	18.20	18.35	18.50	18.65	18.80	18.95	19.10	19.25	19.40	19.55	19.70	19.85	20.00	20.15	20.29	20.44	20.59
61	UA	17.01	17.16	17.32	17.47	17.62	17.78	17.93	18.08	18.23	18.38	18.54	18.69	18.85	19.00	19.15	19.30	19.46	19.61	19.76	19.92	20.07
	FA	17.37	17.52	17.67	17.82	17.97	18.12	16.27	18.42	18.57	18.72	18.87	19.02	19.16	19.31	19.46	19.61	19.76	19.91	20.06	20.21	20.36
60	UA	16.66	16.81	16.97	17.12	17.27	17.43	17.58	17.73	17.88	18.04	18.19	18.34	18.50	18.65	18.80	18.95	19.11	19.26	19.41	19.57	19.72
	FA	17.14	17.29	17.44	17.59	17.74	17.88	18.03	18.18	18.33	18.48	18.63	18.78	18.93	19.08	19.23	19.38	19.53	19.68	19.63	19.98	20.13
59	UA	16.31	16.46	16.62	16.77	16.92	17.08	17.23	17.38	17.53	17.69	17.84	17.99	18.15	18.30	18.45	18.60	18.76	18.91	19.06	19.22	19.37
	FA	16.90	17.05	17.20	17.35	17.50	17.65	17.80	17.95	18.10	18.25	18.40	18.55	18.70	18.85	19.00	19.15	19.30	19.44	10.59	19.74	19.89
58	UA	15.96	16.11	16.27	16.42	16.57	16.73	16.88	17.03	17.18	17.34	17.49	17.64	17.80	17.95	18.10	18.25	18.41	18.56	18.71	18.87	19.02
	FA	16.67	16.82	16.97	17.12	17.27	17.42	17.57	17.72	17.87	18.02	18.17	18.31	18.46	18.61	18.76	18.91	19.06	19.21	19.36	19.51	19.66
57	UA	15.61	15.76	15.92	16.07	16.22	16.38	16.53	16.68	16.83	16.99	17.14	17.29	17.45	17.60	17.75	17.90	18.06	18.21	18.36	18.52	18.67
	FA	16.44	16.59	16.74	16.89	17.03	17.18	17.33	17.48	17.63	17.78	17.93	18.08	18.23	18.38	18.53	18.68	18.83	18.98	19.13	19.28	19.43
56	UA	15.26	15.41	15.57	15.72	15.87	16.03	16.18	16.33	16.48	16.64	16.79	16.94	17.10	17.25	17.40	17.55	17.71	17.86	18.01	18.17	18.32
	FA	16.20	16.35	16.50	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.85	18.00	18.15	18.30	18.45	18.59	18.74	18.89	19.04	19.19
55	UA	14.91	15.06	15.22	15.37	15.52	15.68	15.83	15.98	16.13	16.29	16.44	16.59	16.75	16.90	17.05	17.20	17.36	17.51	17.66	17.82	17.97
	FA	15.97	16.12	16.27	16.42	16.57	16.72	16.87	17.02	17.17	17.32	17.46	17.61	17.76	17.91	18.06	18.21	18.36	18.51	18.66	18.81	18.96
54	UA	14.56	14.71	14.87	15.02	15.17	15.33	15.48	15.63	15.78	15.94	16.09	16.24	16.40	16.55	16.70	16.85	17.01	17.16	17.31	17.47	17.62
	FA	15.74	15.89	16.04	16.18	16.33	16.48	16.63	16.78	16.93	17.08	17.23	17.38	17.53	17.68	17.83	17.98	18.13	18.28	18.43	18.58	18.73
53	UA	14.21	14.36	14.52	14.67	14.82	14.98	15.13	15.28	15.43	15.59	15.74	15.89	16.05	16.20	16.35	16.50	16.66	16.81	16.96	17.12	17.27
	FA	15.50	15.65	15.80	15.95	16.10	16.25	16.40	16.55	16.70	16.85	17.00	17.15	17.30	17.45	17.60	17.74	17.89	18.04	18.19	18.34	18.49

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Fore-arm
	0	0
0		0
.1	.035	.023
.2	.070	.047
.3	.105	.070
.4	.140	.093
.5	.175	.117
.6	.210	.140
.7	.245	.163
.8	.280	.187
.9	.315	.210

Table 91

Norms for Thigh and Calf of Eight-Year-Old Boys (Thigh = .7926 chest circumference + 1.7416 knee - 24.1735; calf = .4163 chest circumference + 1.0000 knee - 7.3652)

Chest Circumference, Centimeters		Knee Width, Centimeters													
		6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4
69	Th	42.36	42.71	43.06	43.40	43.75	44.10	44.45	44.80	45.15	45.49	45.84	46.19	46.54	46.89
	Ca	28.16	28.36	28.56	28.76	28.96	29.16	29.36	29.56	29.76	29.96	30.16	30.36	30.56	30.76
68	Th	41.57	41.91	42.26	42.61	42.96	43.31	43.66	44.00	44.35	44.70	45.05	45.40	45.75	46.09
	Ca	27.74	27.94	28.14	28.34	28.54	28.74	28.94	29.14	29.34	29.54	29.74	29.94	30.14	30.34
67	Th	40.77	41.12	41.47	41.82	42.17	42.52	42.86	43.21	43.56	43.91	44.26	44.61	44.95	45.30
	Ca	27.33	27.53	27.73	27.93	28.13	28.33	28.53	28.73	28.93	29.13	29.33	29.53	29.73	29.93
66	Th	39.98	40.33	40.68	41.03	41.37	41.72	42.07	42.42	42.77	43.12	43.46	43.81	44.16	44.51
	Ca	26.91	27.11	27.31	27.51	27.71	27.91	28.11	28.31	28.51	28.71	28.91	29.11	29.31	29.51
65	Th	39.19	39.54	39.89	40.23	40.58	40.93	41.28	41.63	41.97	42.32	42.67	43.02	43.37	43.72
	Ca	26.49	26.69	26.89	27.09	27.29	27.49	27.69	27.89	28.09	28.29	28.49	28.69	28.89	29.09
64	Th	38.40	38.74	39.09	39.44	39.79	40.14	40.49	40.83	41.18	41.53	41.88	42.23	42.58	42.92
	Ca	26.08	26.28	26.48	26.68	26.88	27.08	27.28	27.48	27.68	27.88	28.08	28.28	28.48	28.68
63	Th	37.60	37.95	38.30	38.65	39.00	39.34	39.69	40.04	40.39	40.74	41.09	41.43	41.78	42.13
	Ca	25.66	25.86	26.06	26.26	26.46	26.66	26.86	27.06	27.26	27.46	27.66	27.86	28.06	28.26
62	Th	36.81	37.16	37.51	37.86	38.20	38.55	38.90	39.25	39.60	39.95	40.29	40.64	40.99	41.34
	Ca	25.25	25.45	25.65	25.85	26.05	26.25	26.45	26.65	26.85	27.05	27.25	27.45	27.65	27.85
61	Th	36.02	36.37	36.71	37.06	37.41	37.76	38.11	38.46	38.80	39.15	39.50	39.85	40.20	40.55
	Ca	24.83	25.03	25.23	25.43	25.63	25.83	26.03	26.23	26.43	26.63	26.83	27.03	27.23	27.43
60	Th	35.23	35.57	35.92	36.27	36.62	36.97	37.32	37.66	38.01	38.36	38.71	39.06	39.41	39.75
	Ca	24.41	24.61	24.81	25.01	25.21	25.41	25.61	25.81	26.01	26.21	26.41	26.61	26.81	27.01
59	Th	34.43	34.78	35.13	35.48	35.83	36.17	36.52	36.87	37.22	37.57	37.92	38.26	38.61	38.96
	Ca	24.00	24.20	24.40	24.60	24.80	25.00	25.20	25.40	25.60	25.80	26.00	26.20	26.40	26.60
58	Th	33.64	33.99	34.34	34.69	35.03	35.38	35.73	36.08	36.43	36.78	37.12	37.47	37.82	38.17
	Ca	23.58	23.78	23.98	24.18	24.38	24.58	24.78	24.98	25.18	25.38	25.58	25.78	25.98	26.18
57	Th	32.85	33.20	33.54	33.89	34.24	34.59	34.94	35.29	35.63	35.98	36.33	36.68	37.03	37.38
	Ca	23.16	23.36	23.56	23.76	23.96	24.16	24.36	24.56	24.76	24.96	25.16	25.36	25.56	25.76
56	Th	32.05	32.40	32.75	33.10	33.45	33.80	34.14	34.49	34.84	35.19	35.54	35.89	36.23	36.58
	Ca	22.75	22.95	23.15	23.35	23.55	23.75	23.95	24.15	24.35	24.55	24.75	24.95	25.15	25.35
55	Th	31.26	31.61	31.96	32.31	32.66	33.00	33.35	33.70	34.05	34.40	34.75	35.09	35.44	35.79
	Ca	22.33	22.53	22.73	22.93	23.13	23.33	23.53	23.73	23.93	24.13	24.33	24.53	24.73	24.93
54	Th	30.47	30.82	31.17	31.51	31.86	32.21	32.56	32.91	33.26	33.60	33.95	34.30	34.65	35.00
	Ca	21.92	22.12	22.32	22.52	22.72	22.92	23.12	23.32	23.52	23.72	23.92	24.12	24.32	24.52
53	Th	29.68	30.03	30.37	30.72	31.07	31.42	31.77	32.12	32.46	32.81	33.16	33.51	33.86	34.21
	Ca	21.50	21.70	21.90	22.10	22.30	22.50	22.70	22.90	23.10	23.30	23.50	23.70	23.90	24.10

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.174	0	.100
.1	.079	.253	.042	.142
.2	.159	.333	.083	.183
.3	.238	.412	.125	.225
.4	.317	.491	.167	.267
.5	.396	.570	.208	.308
.6	.476	.650	.250	.350
.7	.555	.729	.291	.391
.8	.634	.808	.333	.433
.9	713	.888	.375	.475

Table 92

Norms for Upper Arm and Forearm of Nine-Year-Old Boys (Upper arm = .2907 chest circumference + 1.6802 elbow - 8.0957; forearm = .1671 chest circumference + 1.5035 elbow + .7096)

Chest Circumference, Centimeters		Elbow Width, Centimeters																						
		4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6
73	UA	20.52	20.69	20.85	21.02	21.19	21.36	21.53	21.69	21.86	22.03	22.20	22.37	22.53	22.70	22.87	23.03	23.21	23.37	23.54	23.71	23.88	24.05	24.21
	FA	19.52	19.67	19.82	19.97	20.12	20.28	20.43	20.58	20.73	20.88	21.03	21.18	21.33	21.48	21.63	21.78	21.93	22.08	22.23	22.38	22.53	22.68	22.83
72	UA	20.23	20.40	20.56	20.73	20.90	21.07	21.24	21.40	21.57	21.74	21.91	22.08	22.24	22.41	22.58	22.75	22.92	23.08	23.25	23.42	23.59	23.76	23.92
	FA	19.36	19.51	19.66	19.81	19.96	20.11	20.26	20.41	20.56	20.71	20.86	21.01	21.16	21.31	21.46	21.61	21.76	21.91	22.06	22.21	22.36	22.51	22.66
71	UA	19.94	20.10	20.27	20.44	20.61	20.78	20.94	21.11	21.28	21.45	21.62	21.79	21.95	22.12	22.29	22.46	22.63	22.79	22.96	23.13	23.30	23.47	23.63
	FA	19.19	19.34	19.49	19.64	19.79	19.94	20.09	20.24	20.39	20.54	20.69	20.84	20.99	21.14	21.29	21.44	21.59	21.75	21.90	22.05	22.20	22.35	22.50
70	UA	19.65	19.81	19.98	20.15	20.32	20.49	20.65	20.82	20.99	21.16	21.33	21.49	21.66	21.83	22.00	22.17	22.33	22.50	22.67	22.84	23.01	23.17	23.34
	FA	19.02	19.17	19.32	19.47	19.62	19.77	19.92	20.07	20.22	20.38	20.53	20.68	20.83	20.98	21.13	21.28	21.43	21.58	21.73	21.88	22.03	22.18	22.33
69	UA	19.36	19.52	19.69	19.86	20.03	20.20	20.36	20.53	20.70	20.87	21.04	21.20	21.37	21.54	21.71	21.88	22.04	22.21	22.38	22.55	22.72	22.89	23.05
	FA	18.85	19.01	19.16	19.31	19.46	19.61	19.76	19.91	20.06	20.21	20.36	20.51	20.66	20.81	20.96	21.11	21.26	21.41	21.56	21.71	21.86	22.01	22.16
68	UA	19.06	19.23	19.40	19.57	19.74	19.90	20.07	20.24	20.41	20.58	20.74	20.91	21.08	21.25	21.42	21.59	21.75	21.92	22.09	22.26	22.43	22.59	22.76
	FA	18.69	18.84	18.99	19.14	19.29	19.44	19.59	19.74	19.89	20.04	20.19	20.34	20.49	20.64	20.79	20.94	21.09	21.24	21.39	21.54	21.69	21.84	22.00
67	UA	18.77	18.94	19.11	19.28	19.45	19.61	19.78	19.95	20.12	20.29	20.45	20.62	20.79	20.96	21.13	21.29	21.46	21.63	21.80	21.97	22.13	22.30	22.47
	FA	18.52	18.67	18.82	18.97	19.12	19.27	19.42	19.57	19.72	19.87	20.02	20.17	20.32	20.48	20.63	20.78	20.93	21.08	21.23	21.38	21.53	21.68	21.83
66	UA	18.48	18.65	18.82	18.99	19.16	19.32	19.49	19.66	19.83	20.00	20.16	20.33	20.50	20.67	20.84	21.00	21.17	21.34	21.51	21.68	21.84	22.01	22.18
	FA	18.35	18.50	18.65	18.80	18.96	19.11	19.26	19.41	19.56	19.71	19.86	20.01	20.16	20.31	20.46	20.61	20.76	20.91	21.06	21.21	21.36	21.51	21.66
65	UA	18.19	18.36	18.53	18.70	18.86	19.03	19.20	19.37	19.54	19.70	19.87	20.04	20.21	20.38	20.54	20.71	20.88	21.05	21.22	21.39	21.55	21.72	21.89
	FA	18.19	18.34	18.49	18.64	18.79	18.94	19.09	19.24	19.39	19.54	19.69	19.84	19.99	20.14	20.29	20.44	20.59	20.74	20.89	21.04	21.19	21.34	21.49
64	UA	17.90	18.07	18.24	18.41	18.57	18.74	18.91	19.08	19.25	19.41	19.58	19.75	19.92	20.09	20.25	20.42	20.59	20.76	20.93	21.09	21.26	21.43	21.60
	FA	18.02	18.17	18.32	18.47	18.62	18.77	18.92	19.07	19.22	19.37	19.52	19.67	19.82	19.97	20.12	20.27	20.43	20.58	20.73	20.88	21.03	21.18	21.33
63	UA	17.61	17.78	17.95	18.11	18.28	18.45	18.62	18.79	18.96	19.12	19.29	19.46	19.63	19.80	19.96	20.13	20.30	20.47	20.64	20.80	20.97	21.14	21.31
	FA	17.85	18.00	18.15	18.30	18.45	18.60	18.75	18.90	19.06	19.21	19.36	19.51	19.66	19.81	19.96	20.11	20.26	20.41	20.56	20.71	20.86	21.01	21.16
62	UA	17.32	17.49	17.66	17.82	17.99	18.16	18.33	18.50	18.66	18.83	19.00	19.18	19.34	19.50	19.67	19.84	20.01	20.17	20.34	20.51	20.68	20.85	21.02
	FA	17.69	17.84	17.99	18.14	18.29	18.44	18.59	18.74	18.89	19.04	19.19	19.34	19.49	19.64	19.79	19.94	20.09	20.24	20.39	20.54	20.69	20.84	20.99
61	UA	17.03	17.20	17.37	17.53	17.70	17.87	18.04	18.21	18.37	18.54	18.71	18.87	19.05	19.21	19.38	19.55	19.72	19.89	20.05	20.22	20.39	20.56	20.73
	FA	17.52	17.67	17.82	17.97	18.12	18.27	18.42	18.57	18.72	18.87	19.02	19.17	19.32	19.47	19.62	19.77	19.92	20.07	20.22	20.37	20.53	20.68	20.83
60	UA	16.74	16.91	17.08	17.24	17.41	17.57	17.75	17.92	18.08	18.25	18.42	18.59	18.76	18.92	19.09	19.26	19.43	19.60	19.76	19.93	20.10	20.27	20.44
	FA	17.35	17.50	17.65	17.80	17.95	18.10	18.25	18.40	18.55	18.70	18.85	19.00	19.16	19.31	19.46	19.61	19.76	19.91	20.06	20.21	20.36	20.51	20.66
59	UA	16.45	16.62	16.78	16.95	17.12	17.29	17.46	17.62	17.79	17.96	18.13	18.30	18.46	18.63	18.80	18.97	19.14	19.30	19.47	19.64	19.81	19.98	20.14
	FA	17.18	17.33	17.48	17.63	17.79	17.94	18.09	18.24	18.39	18.54	18.69	18.84	18.99	19.14	19.29	19.44	19.59	19.74	19.89	20.04	20.19	20.34	20.49
58	UA	16.16	16.33	16.49	16.66	16.83	17.00	17.17	17.33	17.50	17.67	17.84	18.01	18.17	18.34	18.51	18.68	18.85	19.01	19.18	19.35	19.52	19.69	19.85
	FA	17.02	17.17	17.32	17.47	17.62	17.77	17.92	18.07	18.22	18.37	18.52	18.67	18.82	18.97	19.12	19.27	19.42	19.57	19.72	19.87	20.02	20.17	20.32
57	UA	15.87	16.04	16.20	16.37	16.54	16.71	16.88	17.04	17.21	17.38	17.55	17.72	17.88	18.05	18.22	18.39	18.55	18.72	18.89	19.06	19.23	19.40	19.56
	FA	16.85	17.00	17.15	17.30	17.45	17.60	17.75	17.90	18.05	18.20	18.35	18.50	18.65	18.80	18.95	19.10	19.26	19.41	19.56	19.71	19.86	20.01	20.16
56	UA	15.58	15.74	15.91	16.08	16.25	16.42	16.58	16.75	16.92	17.09	17.26	17.42	17.59	17.76	17.93	18.10	18.26	18.43	18.60	18.77	18.94	19.10	19.27
	FA	16.68	16.83	16.98	17.13	17.28	17.43	17.58	17.74	17.89	18.04	18.19	18.34	18.49	18.64	18.79	18.94	19.09	19.24	19.39	19.54	19.69	19.84	19.99
55	UA	15.29	15.45	15.62	15.79	18.96	16.13	16.29	16.46	16.63	16.80	16.97	17.13	17.30	17.47	17.64	17.81	17.97	18.14	18.31	18.48	18.65	18.81	18.98
	FA	16.52	16.67	16.82	16.97	17.12	17.27	17.42	17.57	17.72	17.87	18.02	18.17	18.32	18.47	18.62	18.77	18.92	19.07	19.22	19.37	19.52	19.67	19.82
54	UA	14.99	15.16	15.33	15.50	15.67	15.84	16.00	16.17	16.34	16.51	16.68	16.84	17.01	17.18	17.35	17.52	17.68	17.85	18.02	18.19	18.36	18.52	18.69
	FA	16.35	16.50	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.85	18.00	18.15	18.30	18.45	18.60	18.75	18.90	19.05	19.21	19.36	19.51	19.66
53	UA	14.70	14.87	15.04	15.21	15.37	15.54	15.71	15.88	16.05	16.22	16.38	16.55	16.72	16.89	17.06	17.22	17.39	17.56	17.73	17.90	18.06	18.23	18.40
	FA	16.18	16.33	16.48	16.63	16.78	16.93	17.08	17.23	17.38	17.53	17.68	17.84	17.99	18.14	18.29	18.44	18.59	18.74	18.89	19.04	19.19	19.34	19.49
52	UA	14.41	14.58	14.75	14.92	15.09	15.25	15.42	15.59	15.76	15.93	16.09	16.26	16.43	16.60	16.77	16.93	17.10	17.27	17.44	17.61	17.77	17.94	18.11
	FA	16.01	16.16	16.31	16.47	16.62	16.77	16.92	17.07	17.22	17.37	17.52	17.67	17.82	17.97	18.12	18.27	18.42	18.57	18.72	18.87	19.02	19.17	19.32

Interpolation Table

Chest Circumference	Elbow Upper Arm	Elbow Forearm
	0	0
0	0	0
.1	.029	.017
.2	.058	.033
.3	.087	.050
.4	.116	.067
.5	.145	.084
.6	.174	.100
.7	.203	.117
.8	.233	.134
.9	.262	.150

Table 93

Norms for Thigh and Calf of Nine-Year-Old Boys (Thigh = .6520 chest circumference + 1.9696 knee - 17.1724; calf = .2525 chest circumference + 1.3821 knee - .1330)

Chest Circumference, Centimeters		Knee Width, Centimeters														
		6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6
73	Th	43.82	44.21	44.60	45.00	45.39	45.79	46.18	46.57	46.97	47.36	47.75	48.15	48.54	48.94	49.33
	Ca	27.82	28.09	28.37	28.65	28.92	29.20	29,48	29.75	30.03	30.31	30.58	30.86	31.13	31.41	31.69
72	Th	43.16	43.56	43.95	44.35	44.74	45.13	45.53	45.92	46.32	46.71	47.10	47.50	47.89	48.30	48.68
	Ca	27.56	27.84	28.12	28.39	28.67	28.95	29.22	29.50	29.78	30.05	30.33	30.61	30.88	31.16	31.43
71	Th	42.51	42.91	43.30	43.69	44.09	44.48	44.88	45.27	45.66	46.06	46.45	46.85	47.24	47.63	48.03
	Ca	27.31	27.59	27.87	28.14	28.42	28.69	28.97	29.25	29.52	29.80	30.08	30.35	30.63	30.91	31.18
70	Th	41.86	42.25	42.65	43.04	43.44	43.83	44.22	44.62	45.01	45.41	45.80	46.19	46.59	46.98	47.38
	Ca	27.06	27.34	27.61	27.89	28.17	28.44	28.72	28.99	29.27	29.55	29.82	30.10	30.38	30.65	30.93
69	Th	41.21	41.60	42.00	42.39	42.78	43.18	43.57	43.97	44.36	44.75	45.15	45.54	45.94	46.33	46.72
	Ca	26.81	27.08	27.36	27.64	27.91	28.19	28.47	28.74	29.02	29.30	29.57	29.85	30.12	30.40	30.68
68	Th	40.56	40.95	41.34	41.74	42.13	42.53	42.92	43.31	43.71	44.10	44.50	44.89	45.28	45.68	46.07
	Ca	26.55	26.83	27.11	27.38	27.66	27.94	28.21	28.49	28.77	29.04	29.32	29.60	29.87	30.15	30.42
67	Th	39.90	40.30	40.69	41.09	41.48	41.87	42.27	42.66	43.06	43.45	43.84	44.24	44.63	45.03	45.42
	Ca	26.30	26.58	26.86	27.13	27.41	27.68	27.96	28.24	28.51	28.79	29.07	29.34	29.62	29.90	30.17
66	Th	39.25	39.65	40.04	40.43	40.83	41.22	41.62	42.01	42.40	42.80	43.19	43.59	43.98	44.37	44.77
	Ca	26.05	26.33	26.60	26.88	27.16	27.43	27.71	27.98	28.26	28.54	28.81	29.09	29.37	29.64	29.92
65	Th	38.60	38.99	39.39	39.78	40.18	40.57	40.96	41.36	41.75	42.15	42.54	42.93	43.33	43.72	44.12
	Ca	25.80	26.07	26.35	26.63	26.90	27.18	27.45	27.73	28.01	28.29	28.56	28.84	29.11	29.39	29.67
64	Th	37.95	38.34	38.74	39.13	39.52	39.92	40.31	40.71	41.10	41.49	41.89	42.28	42.68	43.07	43.46
	Ca	25.54	25.82	26.10	26.37	26.65	26.93	27.20	27.48	27.76	28.03	28.31	28.59	28.86	29.14	29.41
63	Th	37.30	37.69	38.08	38.48	38.87	39.27	39.66	40.05	40.45	40.84	41.24	41.63	42.02	42.42	42.81
	Ca	25.29	25.57	25.85	26.12	26.40	26.67	26.95	27.23	27.50	27.78	28.06	28.33	28.61	28.89	29.16
62	Th	36.64	37.04	37.43	37.83	38.22	38.61	39.01	39.40	39.80	40.19	40.58	40.98	41.37	41.77	42.16
	Ca	25.04	25.32	25.59	25.87	26.15	26.42	26.70	26.97	27.25	27.53	27.80	28.08	28.36	28.63	28.91
61	Th	35.99	36.39	36.78	37.17	37.57	37.96	38.36	38.75	39.14	39.54	39.93	40.33	40.72	41.11	41.51
	Ca	24.79	25.06	25.34	25.62	25.89	26.17	26.45	26.72	27.00	27.28	27.55	27.83	28.10	28.38	28.66
60	Th	35.34	35.73	36.13	36.52	36.92	37.31	37.70	38.10	38.49	38.89	39.28	39.67	40.07	40.46	40.86
	Ca	24.53	24.81	25.09	25.36	25.64	25.92	26.19	26.47	26.75	27.02	27.30	27.58	27.85	28.13	28.40
59	Th	34.69	35.08	35.48	35.87	36.26	36.66	37.05	37.45	37.84	38.23	38.63	39.02	39.42	39.81	40.20
	Ca	24.28	24.56	24.84	25.11	25.39	25.66	25.94	26.22	26.49	26.77	27.05	27.32	27.60	27.88	28.15
58	Th	34.04	34.43	34.82	35.22	35.61	36.01	36.40	36.79	37.19	37.58	37.98	38.37	38.76	39.16	39.55
	Ca	24.02	24.31	24.58	24.86	25.14	25.41	25.69	25.96	26.24	26.52	26.79	27.07	27.35	27.62	27.90
57	Th	33.38	33.78	34.17	34.57	34.96	35.35	35.75	36.14	36.54	36.93	37.32	37.72	38.11	38.51	38.90
	Ca	23.78	24.05	24.33	24.61	24.88	25.16	25.44	25.71	25.99	26.27	26.54	26.82	27.09	27.37	27.65
56	Th	32.73	33.13	33.52	33.91	34.31	34.70	35.10	35.49	35.88	36.28	36.67	37.07	37.46	37.85	38.25
	Ca	23.52	23.80	24.08	24.35	24.63	24.91	25.18	25.46	25.74	26.01	26.29	26.57	26.84	27.12	27.39
55	Th	32.08	32.47	32.87	33.26	33.66	34.05	34.44	34.84	35.23	35.63	36.02	36.41	36.81	37.20	37.60
	Ca	23.27	23.55	23.83	24.10	24.38	24.65	24.93	25.21	25.48	25.76	26.04	26.31	26.59	26.87	27.14
54	Th	31.43	31.82	32.22	32.61	33.00	33.40	33.79	34.19	34.58	34.97	35.37	35.76	36.16	36.55	36.94
	Ca	23.02	23.30	23.57	23.85	24.13	24.40	24.68	24.95	25.23	25.51	25.78	26.06	26.34	26.61	26.89
53	Th	30.78	31.17	31.56	31.96	32.35	32.75	33.14	33.53	33.93	34.32	34.72	35.11	35.50	35.90	36.29
	Ca	22.77	23.04	23.32	23.60	23.87	24.15	24.42	24.70	24.98	25.26	25.53	25.81	26.08	26.36	26.64
52	Th	30.12	30.52	30.91	31.31	31.70	32.09	32.49	32.88	33.28	33.67	34.06	34.46	34.85	35.24	35.64
	Ca	22.51	22.79	23.07	23.34	23.62	23.90	24.17	24.45	24.73	25.00	25.28	25.56	25.83	26.11	26.38

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.197	0	.138
.1	.065	.262	.025	.163
.2	.130	.327	.051	.189
.3	.196	.393	.076	.214
.4	.261	.458	.101	.239
.5	.326	.522	.126	.264
.6	.391	.588	.152	.290
.7	.456	.653	.177	.315
.8	.522	.719	.202	.340
.9	.587	.784	.227	.365

Table 94

Norms for Upper Arm and Forearm of Ten-Year-Old Boys (Upper arm = .3315 chest circumference + 1.6123 elbow - 10.3718; forearm = .2274 chest circumference + 1.4654 elbow - 2.7847)

Chest Circumference, Centimeters		Elbow Width, Centimeters																						
		4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7
76	UA	22.08	22.24	22.40	22.56	22.72	22.88	23.04	23.21	23.37	23.53	23.69	23.85	24.01	24.17	24.33	24.50	24.66	24.82	24.98	25.14	25.30	25.46	25.62
	FA	21.09	21.23	21.39	21.53	21.68	21.83	21.97	22.12	22.26	22.41	22.54	22.70	22.85	23.00	23.14	23.29	23.44	23.58	23.73	23.88	24.02	24.17	24.32
75	UA	21.75	21.91	22.07	22.23	22.39	22.55	22.71	22.87	23.03	23.20	23.36	23.52	23.68	23.84	24.00	24.16	24.33	24.49	24.65	24.81	24.97	25.13	25.29
	FA	20.86	21.01	21.16	21.30	21.45	21.60	21.74	21.89	22.04	22.18	22.33	22.48	22.62	22.77	22.92	23.06	23.21	23.36	23.50	23.65	23.80	23.94	24.09
74	UA	21.41	21.58	21.74	21.90	22.06	22.22	22.38	22.54	22.70	22.87	23.03	23.19	23.35	23.51	23.67	23.83	23.99	24.16	24.32	24.48	24.64	24.80	24.96
	FA	20.64	20.78	20.93	21.08	21.22	21.37	21.52	21.66	21.81	21.96	22.10	22.25	22.40	22.54	22.69	22.84	22.98	23.13	23.27	23.42	23.57	23.71	23.86
73	UA	21.08	21.24	21.41	21.57	21.73	21.89	22.05	22.21	22.37	22.53	22.70	22.86	23.02	23.18	23.34	23.50	23.66	23.82	23.99	24.15	24.31	24.47	24.63
	FA	20.41	20.55	20.70	20.85	21.00	21.14	21.29	21.44	21.58	21.73	21.88	22.02	22.17	22.31	22.46	22.61	22.75	22.90	23.05	23.19	23.34	23.49	23.63
72	UA	20.75	21.91	21.07	21.24	21.40	21.56	21.72	21.88	22.04	22.20	22.36	22.53	22.69	22.85	23.01	23.17	23.33	23.49	23.65	23.81	23.98	24.14	24.30
	FA	20.18	20.32	20.48	20.62	20.77	20.92	21.06	21.21	21.35	21.50	21.65	21.79	21.94	22.09	22.23	22.38	22.53	22.67	22.82	22.97	23.11	23.26	23.41
71	UA	20.42	20.58	20.74	20.90	21.06	21.23	21.39	21.55	21.71	21.87	22.03	22.19	22.35	22.52	22.68	22.83	23.00	23.16	23.32	23.48	23.64	23.81	23.97
	FA	19.96	20.10	20.25	20.39	20.54	20.69	20.83	20.98	21.13	21.27	21.42	21.57	21.71	21.86	22.01	22.15	22.30	22.45	22.59	22.74	22.89	23.03	23.18
70	UA	20.09	20.25	20.41	20.57	20.73	20.89	21.06	21.22	21.38	21.54	21.70	21.86	22.02	21.18	22.35	22.51	22.67	22.83	22.99	23.15	23.31	23.47	23.64
	FA	19.73	19.87	20.02	20.17	20.31	20.46	20.61	20.75	20.90	21.05	21.19	21.34	21.49	21.63	21.78	21.93	22.07	22.22	22.37	22.51	22.66	22.81	22.95
69	UA	19.76	19.92	20.08	20.24	20.40	20.56	20.72	20.89	21.05	21.21	21.37	21.53	21.69	21.85	22.01	22.18	22.34	22.50	22.66	22.82	22.98	23.14	23.30
	FA	19.50	19.65	19.79	19.94	20.09	20.23	20.38	20.53	20.67	20.82	20.97	21.11	21.26	21.41	21.55	21.70	21.84	21.99	22.14	22.28	22.43	22.58	22.72
68	UA	19.43	19.59	19.75	19.91	20.07	20.23	20.39	20.55	20.72	20.88	21.04	21.20	21.36	21.52	21.68	21.84	22.01	22.17	22.33	22.49	22.65	22.81	22.97
	FA	19.27	19.42	19.57	19.71	19.86	20.01	20.15	20.30	20.45	20.59	20.74	20.89	21.03	21.18	21.32	21.47	21.62	21.76	21.91	22.06	22.20	22.35	22.50
67	UA	19.09	19.26	19.42	19.58	19.74	19.90	20.06	20.22	20.38	20.55	20.71	20.87	21.03	21.19	21.35	21.51	21.67	21.83	22.00	22.16	22.32	22.48	22.64
	FA	19.05	19.19	19.34	19.49	19.63	19.78	19.92	20.07	20.22	20.36	20.51	20.66	20.80	20.95	21.10	21.24	21.39	21.54	21.68	21.83	21.98	22.12	22.27
66	UA	18.76	18.92	19.09	19.25	19.41	19.57	19.73	19.89	20.05	20.21	20.37	20.54	20.70	20.86	21.02	21.18	21.34	21.50	21.66	21.83	21.99	22.15	22.31
	FA	18.82	18.96	19.11	19.26	19.40	19.55	19.70	19.84	19.99	20.14	20.28	20.42	20.58	20.72	20.87	21.02	21.16	21.31	21.46	21.60	21.75	21.89	22.04
65	UA	18.43	18.59	18.75	18.91	19.08	19.24	19.40	19.56	19.72	19.88	20.04	20.20	20.37	20.53	20.69	20.85	21.01	21.17	21.33	21.49	21.66	21.82	21.98
	FA	18.59	18.73	18.88	19.03	19.18	19.32	19.47	19.62	19.76	19.91	20.06	20.20	20.35	20.50	20.64	20.79	20.94	21.08	21.23	21.37	21.52	21.67	21.81
64	UA	18.10	18.26	18.42	18.58	18.74	18.91	19.07	19.23	19.39	19.55	19.71	19.87	20.03	20.20	20.36	20.52	20.68	20.84	21.00	21.16	21.32	21.49	21.65
	FA	18.36	18.51	18.66	18.80	18.95	19.10	19.24	19.39	19.54	19.68	19.83	19.98	20.12	20.27	20.41	20.56	20.71	20.85	21.00	21.15	21.29	21.44	21.59
63	UA	17.77	17.93	18.09	18.25	18.41	18.57	18.74	18.90	19.06	19.22	19.38	19.54	19.70	19.86	20.03	20.19	20.35	20.51	20.67	20.83	20.99	21.15	21.32
	FA	18.14	18.28	18.43	18.58	18.72	18.87	19.02	19.16	19.31	19.45	19.60	19.75	19.89	20.04	20.19	20.33	20.48	20.63	20.77	20.92	21.07	21.21	21.36
62	UA	17.44	17.60	17.76	17.92	18.08	18.24	18.40	18.57	18.73	18.89	19.05	19.21	19.37	19.53	19.69	19.86	20.02	20.18	20.34	20.50	20.66	20.82	20.98
	FA	17.91	17.05	17.20	17.35	17.49	18.64	18.79	18.93	19.08	19.23	19.37	19.52	19.67	19.81	19.96	20.11	20.25	20.40	20.55	20.69	20.84	20.98	21.13
61	UA	17.11	17.27	17.43	17.59	17.75	17.91	18.07	18.23	18.39	18.56	18.72	18.88	19.04	19.20	19.36	19.52	19.68	19.85	20.01	20.17	20.33	20.49	20.65
	FA	17.68	17.83	17.97	18.12	18.27	18.41	18.56	18.71	18.85	19.00	19.15	19.24	19.44	19.59	19.73	19.88	20.03	20.17	20.32	20.47	20.61	20.76	20.90
60	UA	16.77	16.93	17.10	17.26	17.42	17.58	17.74	17.90	18.06	18.22	18.39	18.55	18.71	18.87	19.03	19.19	19.35	19.51	19.68	19.84	20.00	20.16	20.32
	FA	17.45	17.60	17.75	17.89	18.04	18.18	18.33	18.48	18.63	18.77	18.92	19.07	19.21	19.36	19.51	19.65	19.80	19.94	20.10	20.24	20.38	20.53	20.68
59	UA	16.44	16.60	16.76	16.93	17.09	17.25	17.41	17.57	17.73	17.89	18.05	18.22	18.38	18.54	18.70	18.86	19.02	19.18	19.34	19.51	19.67	19.83	19.99
	FA	17.23	17.37	17.52	17.67	17.81	17.96	18.10	18.25	18.40	18.55	18.69	18.84	18.98	19.13	19.28	19.42	19.57	19.72	19.86	20.01	20.16	20.30	20.45
58	UA	16.11	16.27	16.43	16.59	16.76	16.92	17.08	17.24	17.40	17.56	17.72	17.88	18.05	18.21	19.37	18.53	18.69	18.85	19.01	19.17	19.34	19.50	19.66
	FA	17.00	17.15	17.29	17.44	17.58	17.73	17.88	18.02	18.17	18.32	18.46	18.61	18.76	18.90	19.05	19.20	19.34	19.49	19.64	19.78	19.93	20.08	20.22
57	UA	15.78	15.94	16.10	16.26	16.42	16.59	16.75	16.91	17.07	17.23	17.39	17.55	17.71	17.88	18.04	18.20	18.36	18.52	18.68	18.84	19.00	19.17	19.33
	FA	16.77	16.91	17.06	17.21	17.36	17.50	17.65	17.80	17.94	18.09	18.24	18.38	18.53	18.68	18.82	18.96	19.12	19.26	19.41	19.56	19.70	19.85	20.00
56	UA	15.45	15.61	15.77	15.93	16.09	16.25	16.41	16.58	16.74	16.90	17.06	17.22	17.38	17.54	17.71	17.87	18.03	18.19	18.35	18.51	18.67	18.83	19.00
	FA	16.54	16.69	16.84	16.98	17.13	17.28	17.42	17.57	17.72	17.86	18.01	18.16	18.30	18.45	18.60	18.74	18.88	19.04	19.18	19.33	19.47	19.62	19.77
55	UA	15.12	15.28	15.44	15.60	15.76	15.92	16.08	16.25	16.41	16.57	16.73	16.89	17.05	17.21	17.37	17.54	17.70	17.86	18.02	18.18	18.34	18.50	18.66
	FA	16.32	16.46	16.61	16.76	16.90	17.05	17.20	17.34	17.49	17.64	17.78	17.93	18.08	18.22	18.37	18.51	18.66	18.81	18.95	19.10	19.25	19.39	19.54
54	UA	14.78	14.95	15.11	15.27	15.43	15.59	15.75	15.91	16.07	16.24	16.40	16.55	16.72	16.88	17.04	17.20	17.36	17.53	17.69	17.85	18.01	18.17	18.33
	FA	16.09	16.24	16.38	16.53	16.68	16.82	16.97	17.11	17.26	17.41	17.55	17.70	17.85	17.99	18.14	18.29	18.43	18.58	18.73	18.87	19.02	19.17	19.31

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Fore-arm
	0	0
0	0	0
.1	.033	.023
.2	.066	.045
.3	.099	.068
.4	.133	.091
.5	.166	.114
.6	.199	.136
.7	.232	.159
.8	.265	.182
.9	.298	.205

Table 55

Norms for Thigh and Calf of Ten-Year-Old Boys (Thigh = .7564 chest circumference + 1.4088 knee - 19.0756; calf = .3438 chest circumference + 1.5640 knee - 7.4602)

Chest Circumference, Centimeters		Knee Width, Centimeters																	
		6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2
76	Th	47.99	48.27	48.55	48.84	49.12	49.40	49.68	49.96	50.24	50.53	50.81	51.09	51.37	51.65	51.94	52.22	52.50	52.78
	Ca	29.30	29.61	29.93	30.24	30.56	30.87	31.18	31.49	31.81	32.12	32.43	32.74	33.06	33.37	33.68	34.00	34.31	34.62
75	Th	47.23	47.52	47.80	48.08	48.36	48.64	48.92	49.21	49.49	49.77	50.05	50.33	50.62	50.90	51.18	51.46	51.74	52.02
	Ca	28.96	29.27	29.59	29.90	30.21	30.52	30.84	31.15	31.46	31.78	32.09	32.40	32.71	33.03	33.34	33.65	33.96	34.28
74	Th	46.48	46.76	47.04	47.32	47.60	47.88	48.17	48.45	48.73	49.01	49.30	49.58	49.86	50.14	50.42	50.70	50.99	51.27
	Ca	28.62	28.93	29.24	29.55	29.87	30.18	30.49	30.81	31.12	31.43	31.74	32.06	32.37	32.68	33.00	33.31	33.62	33.93
73	Th	45.72	46.00	46.28	46.57	46.85	47.13	47.41	47.69	47.98	48.26	48.54	48.82	49.10	49.38	49.67	49.95	50.23	50.51
	Ca	28.27	28.59	28.90	29.21	29.52	29.84	30.15	30.46	30.77	31.09	31.40	31.71	32.03	32.34	32.65	32.96	33.28	33.59
72	Th	44.97	45.25	45.53	45.81	46.09	46.37	46.66	46.94	47.22	47.50	47.78	48.06	48.35	48.63	48.91	49.19	49.47	49.75
	Ca	27.93	28.24	28.55	28.87	29.18	29.49	29.81	30.12	30.43	30.74	31.06	31.37	31.68	32.00	32.31	32.62	32.93	33.25
71	Th	44.21	44.49	44.77	45.05	45.34	45.62	45.90	46.18	46.46	46.74	47.03	47.31	47.59	47.87	48.15	48.44	48.72	49.00
	Ca	27.58	27.90	28.21	28.52	28.84	29.15	29.46	29.77	30.09	30.40	30.71	31.03	31.34	31.65	31.96	32.28	32.59	32.90
70	Th	43.45	43.73	44.02	44.30	44.58	44.86	45.14	45.42	45.71	45.99	46.27	46.55	46.83	47.12	47.40	47.68	47.96	48.24
	Ca	27.24	27.56	27.87	28.18	28.49	28.81	29.12	29.43	29.74	30.06	30.37	30.68	30.99	31.31	31.62	31.93	32.25	32.56
69	Th	42.70	42.98	43.26	43.54	43.82	44.10	44.39	44.67	44.95	45.23	45.51	45.80	46.08	46.36	46.64	46.92	47.20	47.49
	Ca	26.90	27.21	27.52	27.84	28.15	28.46	28.77	29.09	29.40	29.71	30.03	30.34	30.65	30.96	31.28	31.59	31.90	32.21
68	Th	41.94	42.22	42.50	42.78	43.07	43.35	43.63	43.91	44.19	44.48	44.76	45.04	45.32	45.60	45.88	46.17	46.45	46.73
	Ca	26.55	26.87	27.18	27.49	27.80	28.12	28.43	28.74	29.06	29.37	29.68	29.99	30.31	30.62	30.93	31.25	31.56	31.87
67	Th	41.18	41.46	41.75	42.03	42.31	42.59	42.87	43.16	43.44	43.72	44.00	44.28	44.56	44.85	45.13	45.41	45.69	45.97
	Ca	26.21	26.52	26.84	27.15	27.46	27.77	28.09	28.40	28.71	29.02	29.34	29.65	29.96	30.28	30.59	30.90	31.21	31.53
66	Th	40.43	40.70	40.99	41.27	41.55	41.84	42.12	42.40	42.68	42.96	43.24	43.53	43.81	44.09	44.37	44.65	44.93	45.22
	Ca	25.87	26.18	26.49	26.80	27.12	27.43	27.74	28.06	28.37	28.68	28.99	29.31	29.62	29.93	30.25	30.56	30.87	31.18
65	Th	39.67	39.95	40.23	40.51	40.80	41.08	41.36	41.64	41.92	42.21	42.49	42.77	43.05	43.33	43.61	43.90	44.18	44.46
	Ca	25.52	25.83	26.15	26.46	26.77	27.09	27.40	27.71	28.02	28.34	28.65	28.96	29.27	29.59	29.90	30.21	30.53	30.84
64	Th	38.91	39.19	39.48	39.76	40.04	40.32	40.60	40.89	41.17	41.45	41.73	42.01	42.29	42.58	42.86	43.14	43.42	43.70
	Ca	25.18	25.49	25.80	26.12	26.43	26.74	27.06	27.37	27.68	27.99	28.31	28.62	28.93	29.24	29.56	29.87	30.18	30.50
63	Th	38.16	38.44	38.72	39.00	39.28	39.57	39.85	40.12	40.41	40.69	40.97	41.26	41.54	41.82	42.10	42.38	42.66	42.95
	Ca	24.83	25.14	25.46	35.77	26.09	26.40	26.71	27.02	27.34	27.65	27.96	28.28	28.59	28.90	29.21	29.53	29.84	30.15
62	Th	37.40	37.68	37.96	38.25	38.53	38.81	39.09	39.37	39.65	39.94	40.22	40.50	40.78	41.06	41.34	41.63	41.91	42.19
	Ca	24.49	24.80	25.12	25.42	25.74	26.05	26.37	26.68	26.99	27.31	27.62	27.93	28.24	28.56	28.87	29.18	29.50	29.81
61	Th	36.64	36.93	37.21	37.49	37.77	38.05	38.33	38.62	38.90	39.18	39.46	39.74	40.02	40.31	40.59	40.87	41.15	41.43
	Ca	24.15	24.46	24.77	25.09	25.40	25.71	26.02	26.34	26.65	26.96	27.27	27.59	27.90	28.21	28.53	28.84	29.15	29.46
60	Th	35.89	36.17	36.45	36.73	37.01	37.30	37.58	37.86	38.14	38.42	38.70	38.99	39.27	39.55	39.83	40.11	40.40	40.68
	Ca	23.80	24.12	24.43	24.74	25.05	25.37	25.68	25.99	26.31	26.62	26.93	27.24	27.56	27.87	28.18	28.50	28.81	29.12
59	Th	35.13	35.41	35.70	35.98	36.26	36.54	36.82	37.10	37.39	37.67	37.95	38.23	38.51	38.79	39.08	39.36	39.64	39.92
	Ca	23.46	23.77	24.08	24.40	24.71	25.02	25.34	25.64	25.96	26.27	26.59	26.90	27.21	27.53	27.84	28.15	28.46	28.78
58	Th	34.38	34.66	34.94	35.22	35.50	35.78	36.07	36.35	36.63	36.91	37.19	37.47	37.76	38.04	38.32	38.60	38.88	39.17
	Ca	23.12	23.43	23.74	24.05	24.37	24.68	24.99	25.31	25.62	25.93	26.24	26.56	26.87	27.18	27.49	27.81	28.12	28.43
57	Th	33.62	33.90	34.18	34.46	34.75	35.03	35.31	35.59	35.87	36.15	36.44	36.72	37.00	37.28	37.56	37.85	38.13	38.41
	Ca	22.77	23.08	23.40	23.71	24.02	24.34	24.65	24.96	25.27	25.59	25.90	26.21	26.53	26.84	27.15	27.46	27.78	28.09
56	Th	32.86	33.14	33.43	33.71	33.99	34.27	34.55	34.83	35.12	35.40	35.68	35.96	36.24	36.53	36.81	37.09	37.37	37.65
	Ca	22.43	22.74	23.05	23.37	23.68	23.99	24.30	24.62	24.93	25.24	25.56	25.87	26.18	26.49	26.81	27.12	27.43	27.75
55	Th	32.11	32.39	32.67	32.95	33.23	33.52	33.80	34.08	34.36	34.64	34.92	35.21	35.49	35.77	36.05	36.33	36.61	36.90
	Ca	22.08	22.40	22.71	23.02	23.34	23.65	23.96	24.27	24.59	24.90	25.21	25.52	25.84	26.15	26.46	26.78	27.09	27.40
54	Th	31.35	31.63	31.91	32.20	32.48	32.76	33.04	33.32	33.60	33.89	34.17	34.45	34.73	35.01	35.29	35.58	35.86	36.14
	Ca	21.74	22.05	22.37	22.68	22.99	23.30	23.62	23.93	24.24	24.56	24.87	25.18	25.49	25.81	26.12	26.43	26.75	27.06

Interpolation Table

Chest Circumference	Knee Thigh		Calf	
	0	.1	0	.1
0	0	.141	0	.156
.1	.076	.217	.034	.191
.2	.151	.292	.069	.225
.3	.226	.368	.103	.260
.4	.303	.443	.138	.294
.5	.378	.519	.172	.328
.6	.454	.595	.206	.363
.7	.529	.670	.241	.397
.8	.605	.746	.275	.431
.9	.681	.822	.309	.466

Table 96

Norms for Upper Arm and Forearm of Eleven-Year-Old Boys (Upper arm = .2898 chest circumference + 1.5865 elbow - 5.7326; forearm = .1865 chest circumference + 1.7485 elbow - 1.7880)

Chest Circumference, Centimeters		Elbow Width, Centimeters																					
		4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7
77	UA	21.57	21.73	21.89	22.05	22.20	22.36	22.52	22.68	22.84	23.00	23.16	23.32	23.47	23.63	23.79	23.95	24.11	24.27	24.43	24.58	24.74	24.90
	FA	20.62	20.79	20.97	21.14	21.32	21.49	21.66	21.84	22.01	22.19	22.36	22.54	22.71	22.89	23.06	23.24	23.41	23.59	23.76	23.94	24.11	24.29
76	UA	21.31	21.47	21.63	21.79	21.94	22.10	22.26	22.42	22.58	22.74	22.90	23.06	23.21	23.37	23.53	23.69	23.85	24.01	24.17	24.32	24.48	24.64
	FA	20.43	20.60	20.78	20.95	21.13	21.30	21.48	21.65	21.83	22.00	22.18	22.36	22.53	22.70	22.88	23.05	23.23	23.40	23.58	23.75	23.93	24.10
75	UA	21.05	21.21	21.37	21.53	21.68	21.84	22.00	22.16	22.32	22.48	22.64	22.80	22.95	23.11	23.27	23.43	23.59	23.75	23.91	24.06	24.22	24.38
	FA	20.24	20.42	20.59	20.79	20.94	21.12	21.29	21.47	21.64	21.82	21.99	22.17	22.34	22.52	22.59	22.87	23.04	23.22	23.39	23.56	23.74	23.91
74	UA	20.79	20.95	21.11	21.27	21.43	21.58	21.74	21.90	22.06	22.22	22.38	22.54	22.69	22.85	23.01	23.17	23.33	23.49	23.65	23.80	23.96	24.12
	FA	20.06	20.23	20.41	20.58	20.76	20.93	21.11	21.28	21.45.	21.63	21.80	21.98	22.15	22.33	22.50	22.68	22.85	23.03	23.20	23.38	23.55	23.73
73	UA	20.53	20.69	20.85	21.01	21.17	21.32	21.48	21.64	21.80	21.96	22.12	22.28	22.43	22.59	22.75	22.91	23.07	23.23	23.39	23.55	23.70	23.86
	FA	19.87	20.04	20.22	20.39	20.57	20.74	20.92	21.09	21.27	21.44	21.62	21.79	21.97	22.14	22.32	22.49	22.67	22.84	23.02	23.19	23.37	23.54
72	UA	20.27	20.43	20.59	20.75	20.91	21.06	21.22	21.38	21.54	21.70	21.86	22.02	22.17	22.33	22.49	22.65	22.81	22.97	23.13	23.29	23.44	23.60
	FA	19.68	19.86	20.03	20.21	20.38	20.56	20.73	20.91	21.08	21.26	21.43	21.61	21.78	21.96	22.13	22.31	22.48	22.66	22.83	23.01	23.19	23.35
71	UA	20.01	20.17	20.33	20.49	20.65	20.80	20.96	21.12	21.28	21.44	21.60	21.76	21.91	22.07	22.23	22.39	22.55	22.71	22.87	23.03	23.18	23.34
	FA	19.50	19.67	19.85	20.02	20.20	20.37	20.55	20.72	20.90	21.07	21.25	21.42	21.59	21.77	21.94	22.12	22.29	22.47	22.64	22.82	22.99	23.17
70	UA	19.75	19.91	20.07	20.23	20.39	20.54	20.70	20.86	21.02	21.18	21.34	21.50	21.66	21.81	21.97	22.13	22.29	22.45	22.61	22.77	22.92	23.08
	FA	19.31	19.48	19.66	19.83	20.01	20.18	20.36	20.53	20.71	20.88	21.06	21.23	21.41	21.58	21.76	21.93	22.11	22.28	22.46	22.63	22.81	22.98
69	UA	19.49	19.65	19.81	19.97	20.13	20.28	20.44	20.60	20.76	20.92	21.09	21.24	21.40	21.55	21.71	21.67	22.03	22.19	22.35	22.51	22.66	22.82
	FA	19.12	19.30	19.47	19.65	19.82	20.00	20.17	20.35	20.52	20.70	20.87	21.05	21.22	21.40	21.57	21.75	21.92	20.10	22.27	22.45	22.62	22.80
68	UA	19.23	19.39	19.55	19.71	19.87	20.02	20.18	20.34	20.50	20.65	20.82	20.98	21.14	21.29	21.45	21.61	21.77	21.93	22.09	22.25	22.40	22.56
	FA	18.94	19.11	19.29	19.46	19.64	19.81	19.99	20.16	20.34	20.51	20.69	20.86	21.04	21.21	21.39	21.56	21.73	21.91	22.08	22.26	22.43	22.61
67	UA	18.97	19.13	19.29	19.45	19.61	19.77	19.92	20.08	20.24	20.40	20.56	20.72	20.88	21.03	21.19	21.35	21.51	21.67	21.83	21.99	22.14	22.30
	FA	18.75	18.92	19.10	19.28	19.45	19.62	19.80	19.97	20.15	20.32	20.50	20.67	20.85	21.02	21.20	21.37	21.55	21.72	21.90	22.07	22.25	22.42
66	UA	18.71	18.87	19.03	19.19	19.35	19.51	19.66	19.82	19.98	20.14	20.30	20.46	20.62	20.77	20.93	21.09	21.25	21.41	21.57	21.73	21.89	22.04
	FA	18.56	18.74	18.91	19.09	19.26	19.44	19.61	19.79	19.96	20.14	20.31	20.49	20.66	20.84	21.01	21.19	21.36	21.54	21.71	21.89	22.06	22.24
65	UA	18.45	18.61	18.77	18.93	19.09	19.25	19.40	19.56	19.72	19.88	20.04	20.20	20.36	20.51	20.67	20.83	20.99	21.15	21.31	21.47	21.63	21.78
	FA	18.38	18.55	18.73	18.90	19.07	19.25	19.43	19.60	19.78	19.95	20.13	20.30	20.48	20.65	20.83	21.00	21.18	21.35	21.52	21.70	21.87	22.05
64	UA	18.19	18.35	18.51	18.67	18.83	18.99	19.14	19.30	19.46	19.62	19.78	19.94	20.10	20.25	20.41	20.57	20.73	20.89	21.05	21.21	21.37	21.52
	FA	18.19	18.37	18.54	18.72	18.89	19.07	19.24	19.42	19.59	19.76	19.94	20.11	20.29	20.46	20.64	20.81	20.99	21.16	21.34	21.51	21.69	21.86
63	UA	17.93	18.09	18.25	18.41	18.57	18.73	18.88	19.04	19.20	19.36	19.52	19.68	19.84	20.00	20.15	20.32	20.47	20.63	20.79	20.95	21.11	21.26
	FA	18.00	18.18	18.35	18.53	18.70	18.88	19.05	19.23	19.40	19.58	19.75	19.93	20.10	20.28	20.45	20.63	20.80	20.98	21.15	21.33	21.50	21.68
62	UA	17.67	17.83	17.99	18.15	18.31	18.47	18.62	18.78	18.94	19.10	19.26	19.42	19.58	19.74	19.89	20.05	20.21	20.37	20.53	20.69	20.85	21.00
	FA	17.82	17.99	18.17	18.34	18.52	18.69	18.87	19.04	19.22	19.39	19.57	19.74	19.92	20.09	20.27	20.44	20.62	20.79	20.97	21.14	21.32	21.49
61	UA	17.41	17.57	17.73	17.89	18.05	18.21	18.37	18.52	18.68	18.84	19.00	19.16	19.32	19.48	19.63	19.79	19.95	20.11	20.27	20.43	20.59	20.74
	FA	17.63	17.81	17.98	18.16	18.33	18.51	18.68	18.86	19.03	19.21	19.38	19.55	19.73	19.90	20.08	20.25	20.43	20.60	20.78	20.95	21.13	21.30
60	UA	17.15	17.31	17.47	17.63	17.79	17.95	18.11	18.26	18.42	18.58	18.74	18.90	19.06	19.22	19.37	19.53	19.69	19.85	20.01	20.17	20.33	20.48
	FA	17.45	17.62	17.79	17.97	18.14	18.32	18.49	18.67	18.84	19.02	19.19	19.37	19.54	19.72	19.89	20.07	20.24	20.42	20.59	20.77	20.94	21.12
59	UA	16.89	17.05	17.21	17.37	17.53	17.69	17.85	18.00	18.16	18.32	18.48	18.64	18.80	18.96	19.11	19.27	19.43	19.59	19.75	19.91	20.07	20.23
	FA	17.26	17.43	17.61	17.78	17.96	18.13	18.31	18.48	18.66	18.83	19.01	19.18	19.36	19.53	19.71	19.88	20.06	20.23	20.41	20.58	20.76	20.93
58	UA	16.63	16.79	16.95	17.11	17.27	17.43	17.59	17.74	17.90	18.06	18.22	18.38	18.54	18.70	18.85	19.01	19.17	19.33	19.49	19.65	19.81	19.97
	FA	17.07	17.25	17.42	17.60	17.77	17.95	18.12	18.30	18.47	18.65	18.82	19.00	19.17	19.35	19.52	19.69	19.87	20.04	20.22	20.39	20.57	20.75
57	UA	16.37	16.53	16.69	16.85	17.01	17.17	17.33	17.48	17.64	17.80	17.96	18.12	18.28	18.44	18.60	18.75	18.91	19.07	19.23	19.39	19.55	19.71
	FA	16.89	17.06	17.24	17.41	17.59	17.76	17.93	18.11	18.28	18.46	18.63	18.81	18.98	19.16	19.33	19.51	19.68	19.86	20.03	20.21	20.38	20.56
56	UA	16.11	16.27	16.43	16.59	16.75	16.91	17.07	17.22	17.38	17.54	17.70	17.86	18.02	18.18	18.34	18.49	18.65	18.81	18.97	19.13	19.29	19.45
	FA	16.70	16.87	17.05	17.22	17.40	17.57	17.75	17.92	18.10	18.27	18.45	18.62	18.80	18.97	19.15	19.32	19.50	19.67	19.85	20.02	20.20	20.37

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	
.1	.026	.019
.2	.052	.037
.3	.078	.056
.4	.104	.075
.5	.130	.093
.6	.156	.112
.7	.182	.131
.8	.208	.149
.9	.234	.168

Table 97

Norms for Thigh and Calf of Eleven-Year-Old Boys (Thigh = .5415 chest circumference + 2.3734 knee - 13.7501; calf = .2757 chest circumference + 1.8741 knee - 5.9369)

Chest Circumference, Centimeters		Knee Width, Centimeters																
		7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2
77	Th	44.56	45.03	45.51	45.98	46.46	46.93	47.41	47.88	48.36	48.83	49.31	49.78	50.26	50.73	51.20	51.68	52.15
	Ca	28.41	28.79	29.16	29.54	29.91	30.28	30.66	31.03	31.41	31.78	32.16	32.53	32.91	33.28	33.66	34.03	34.41
76	Th	44.02	44.49	44.97	45.44	45.92	46.39	46.87	47.34	47.82	48.29	48.76	49.24	49.72	50.19	50.66	51.14	51.61
	Ca	28.14	28.51	28.88	29.26	29.63	30.01	30.38	30.76	31.13	31.51	31.88	32.26	32.63	33.01	33.38	33.76	34.13
75	Th	43.48	43.95	44.43	44.90	45.37	45.85	46.32	46.80	47.27	47.75	48.22	48.70	49.17	49.65	50.12	50.60	51.07
	Ca	27.86	28.23	28.61	28.98	29.36	29.73	30.11	30.48	30.86	31.23	31.61	31.98	32.36	32.73	33.11	33.48	33.86
74	Th	42.93	43.41	43.88	44.36	44.83	45.31	45.78	46.26	46.73	47.21	47.68	48.16	48.63	49.11	49.58	50.05	50.53
	Ca	27.58	27.96	28.33	28.71	29.08	29.46	29.83	30.21	30.58	30.96	31.33	31.71	32.08	32.46	32.83	33.21	33.58
73	Th	42.39	42.87	43.34	43.82	44.29	44.77	45.24	45.72	46.19	46.67	47.14	47.61	48.09	48.56	49.04	49.51	49.99
	Ca	27.31	27.68	28.06	28.43	28.81	29.18	29.56	29.93	30.31	30.68	31.06	31.43	31.81	32.18	32.56	32.93	33.31
72	Th	41.85	42.33	42.80	43.28	43.75	44.23	44.70	45.17	45.65	46.12	46.60	47.07	47.55	48.02	48.50	48.97	49.45
	Ca	27.03	27.41	27.78	28.16	28.53	28.91	29.28	29.66	30.03	30.41	30.78	31.16	31.53	31.90	32.28	32.65	30.03
71	Th	41.31	41.78	42.26	42.73	43.21	43.68	44.16	44.63	45.11	45.58	46.06	46.53	47.01	47.48	47.96	48.43	48.91
	Ca	26.76	27.13	27.51	27.88	28.26	28.63	29.01	29.38	29.76	30.13	30.50	30.88	31.25	31.63	32.00	32.38	32.75
70	Th	40.77	41.24	41.72	42.19	42.67	43.14	43.62	44.09	44.57	45.04	45.52	45.99	46.46	46.94	47.41	47.89	48.36
	Ca	26.48	26.86	27.23	27.61	27.98	28.35	28.73	29.10	29.48	29.85	30.23	30.60	30.98	31.35	31.73	32.10	32.48
69	Th	40.23	40.70	41.18	41.65	42.13	42.60	43.08	43.55	44.02	44.50	44.97	45.45	45.92	46.40	46.87	47.35	47.82
	Ca	26.21	26.58	26.95	27.33	27.70	28.08	28.45	28.83	29.20	29.58	29.95	30.33	30.70	31.08	31.45	31.83	32.20
68	Th	39.69	40.16	40.64	41.11	41.58	42.06	42.53	43.01	43.48	43.96	44.43	44.91	45.38	45.86	46.33	46.81	47.28
	Ca	25.93	26.30	26.68	27.05	27.43	27.80	28.18	28.55	28.93	29.30	29.68	30.05	30.43	30.80	31.18	31.55	31.93
67	Th	39.14	39.62	40.09	40.57	41.04	41.52	41.99	42.47	42.94	43.42	43.89	44.37	44.84	45.32	45.79	46.26	46.74
	Ca	25.65	26.03	26.40	26.78	27.15	27.53	27.90	28.28	28.65	29.03	29.40	29.78	30.15	30.53	30.90	31.28	31.65
66	Th	38.60	39.08	39.55	40.03	40.50	40.98	41.45	41.93	42.40	42.87	43.35	43.82	44.30	44.77	45.25	45.72	46.20
	Ca	25.38	25.75	26.13	26.50	26.88	27.25	27.63	28.00	28.38	28.75	29.13	29.50	29.88	30.25	30.63	31.00	31.38
65	Th	38.06	38.54	39.01	39.49	39.96	40.43	40.91	41.38	41.86	42.33	42.81	43.28	43.76	44.23	44.71	45.18	45.66
	Ca	25.10	25.48	25.85	26.23	26.60	26.98	27.35	27.73	28.10	28.48	28.85	29.23	29.60	29.97	30.35	30.72	31.10
64	Th	37.52	37.99	38.47	38.94	39.42	39.89	40.37	40.84	41.32	41.79	42.27	42.74	43.22	43.69	44.17	44.64	45.11
	Ca	24.83	25.20	25.58	25.95	26.33	26.70	27.08	27.45	27.83	28.20	28.57	28.95	29.32	29.70	30.07	30.45	30.82
63	Th	36.98	37.45	37.93	38.40	38.88	39.35	39.83	40.30	40.78	41.25	41.73	42.20	42.67	43.15	43.62	44.10	44.57
	Ca	24.55	24.93	25.30	25.68	26.05	26.43	26.80	27.17	27.55	27.92	28.30	28.67	29.05	29.42	29.80	30.17	30.55
62	Th	36.44	36.91	37.39	37.86	38.34	38.81	39.28	39.76	40.23	40.71	41.18	41.66	42.13	42.61	43.08	43.56	44.03
	Ca	24.28	24.65	25.02	25.40	25.77	26.15	26.52	26.90	27.27	27.65	28.02	28.40	28.77	29.15	29.52	29.90	30.27
61	Th	35.90	36.37	36.84	37.32	37.79	38.27	38.74	39.22	39.69	40.17	40.64	41.12	41.59	42.07	42.54	43.02	43.49
	Ca	24.00	24.37	24.75	25.12	25.50	25.87	26.25	26.62	27.00	27.37	27.75	28.12	28.50	28.87	29.25	29.62	30.00
60	Th	35.35	35.83	36.30	36.78	37.25	37.73	38.20	38.68	39.15	39.63	40.10	40.58	41.05	41.52	42.00	42.47	42.95
	Ca	23.72	24.10	24.47	24.85	25.22	25.60	25.97	26.35	26.72	27.10	27.47	27.85	28.22	28.60	28.97	29.35	29.72
59	Th	34.81	35.29	35.76	36.24	36.71	37.19	37.66	38.13	38.61	39.08	39.56	40.03	40.51	40.98	41.46	41.93	42.41
	Ca	23.45	23.82	24.20	24.57	24.95	25.32	25.70	26.07	26.45	26.82	27.20	27.57	27.95	28.32	28.70	29.07	29.45
58	Th	34.27	34.75	35.22	35.69	36.17	36.64	37.12	37.59	38.07	38.54	39.02	39.49	39.97	40.44	40.92	41.39	41.87
	Ca	23.17	23.55	23.92	24.30	24.67	25.05	25.42	25.80	26.17	26.55	26.92	27.30	27.67	28.05	28.42	28.79	29.17
57	Th	33.73	34.20	34.68	35.15	35.63	36.10	36.58	37.05	37.53	38.00	38.48	38.95	39.43	39.90	40.37	40.85	41.32
	Ca	22.90	23.27	23.65	24.02	24.40	24.77	25.15	25.52	25.90	26.27	26.64	27.02	27.39	27.77	28.14	28.52	28.89
56	Th	33.19	33.66	34.14	34.61	35.09	35.56	36.04	36.51	36.99	37.46	37.93	38.41	38.88	39.36	39.83	40.31	40.78
	Ca	22.62	23.00	23.37	23.75	24.12	24.50	24.87	25.24	25.62	25.99	26.37	26.74	27.12	27.49	27.87	28.24	28.62

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.237	0	.187
.1	.054	.291	.028	.215
.2	.108	.346	.055	.243
.3	.162	.400	.083	.270
.4	.217	.454	.110	.298
.5	.271	.508	.138	.325
.6	.325	.562	.165	.353
.7	.379	.616	.193	.380
.8	.433	.671	.221	.408
.9	.487	.725	.248	.436

Table 98

Norms for Upper Arm and Forearm of Twelve-Year-Old Boys (Upper arm = .2572 chest circumference + 1.4467 elbow - 5.3196; forearm = .1971 chest circumference + 1.2559 elbow + .2231)

Chest Circumference, Centimeters		Elbow Width, Centimeters													
		4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0
80	UA	21.62	21.91	22.20	22.49	22.78	23.07	23.36	23.65	23.94	24.23	24.52	24.80	25.09	25.38
	FA	21.52	21.77	22.02	22.27	22.52	22.77	23.02	23.28	23.53	23.78	24.03	24.28	24.53	24.78
78	UA	21.11	21.40	21.69	21.98	22.26	22.55	22.84	23.13	23.42	23.71	24.00	24.29	24.58	24.87
	FA	21.12	21.37	21.63	21.88	22.13	22.38	22.63	22.88	23.13	23.38	23.63	23.99	24.14	24.39
76	UA	20.59	20.88	21.17	21.46	21.75	22.04	22.33	22.62	22.91	23.20	23.49	23.78	24.07	24.35
	FA	20.73	20.98	21.23	21.48	21.73	21.98	22.24	22.49	22.74	22.99	23.24	23.49	23.74	23.99
74	UA	20.08	20.37	20.66	20.95	21.24	21.53	21.81	22.10	22.39	22.68	22.97	23.26	23.55	23.84
	FA	20.33	20.59	20.84	21.09	21.34	21.59	21.84	22.09	22.34	22.60	22.85	23.10	23.35	23.60
72	UA	19.56	19.85	20.14	20.43	20.72	21.01	21.30	21.59	21.88	22.17	22.46	22.75	23.04	23.33
	FA	19.94	20.19	20.44	20.69	20.94	21.20	21.45	21.70	21.95	22.20	22.45	22.70	22.95	23.21
70	UA	19.05	19.34	19.63	19.92	20.21	20.50	21.79	21.08	21.36	21.65	21.94	22.23	22.52	22.81
	FA	19.55	19.80	20.05	20.30	20.55	20.80	21.05	21.30	21.55	21.81	22.06	22.31	22.56	22.81
68	UA	18.54	18.82	19.11	19.40	19.69	19.98	20.27	20.56	20.85	21.14	21.43	21.72	22.01	22.30
	FA	19.15	19.40	19.65	19.91	20.16	20.41	20.66	20.91	21.16	21.41	21.66	21.91	22.17	22.42
66	UA	18.02	18.31	18.60	18.89	19.18	19.47	19.76	20.05	20.34	20.63	20.91	21.20	21.49	21.78
	FA	18.76	19.01	19.26	19.51	19.76	20.01	20.26	20.52	20.77	21.02	21.27	21.52	21.77	22.02
64	UA	17.51	17.80	18.09	18.37	18.66	18.95	19.24	19.53	19.82	20.11	20.40	20.69	20.98	21.27
	FA	18.36	18.61	18.87	19.12	19.37	19.62	19.87	20.12	20.37	20.62	20.88	21.13	21.38	21.63
62	UA	16.99	17.28	17.57	17.86	18.15	18.44	18.73	19.02	19.31	19.60	19.89	20.18	20.46	20.75
	FA	17.97	18.22	18.47	18.72	18.97	19.23	19.48	19.73	19.98	20.23	20.48	20.73	20.98	21.23
60	UA	16.48	16.77	17.06	17.35	17.64	17.92	18.21	18.50	18.79	19.08	19.37	19.66	19.95	20.24
	FA	17.58	17.83	18.08	18.33	18.58	18.83	19.08	19.33	19.58	19.84	20.09	20.34	20.59	20.84
58	UA	15.96	16.25	16.54	16.83	17.12	17.41	17.70	17.99	18.28	18.57	18.86	19.15	19.44	19.72
	FA	17.18	17.43	17.68	17.93	18.19	18.44	18.69	18.94	19.19	19.44	19.69	19.94	20.20	20.45
56	UA	15.45	15.74	16.03	16.32	16.61	16.90	17.19	17.47	17.76	18.05	18.34	18.63	18.92	19.21
	FA	16.79	17.04	17.29	17.54	17.79	18.04	18.29	18.54	18.80	19.05	19.30	19.55	19.80	20.05
54	UA	14.93	15.22	15.51	15.80	16.09	16.38	16.67	16.96	17.25	17.54	17.83	18.12	18.41	18.70
	FA	16.39	16.64	16.89	17.15	17.40	17.65	17.90	18.15	18.40	18.65	18.90	19.16	19.41	19.56

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.14	0	.12
.1	.03	.17	.02	.15
.2	.05	.20	.04	.17
.3	.08	.22	.06	.18
.4	.10	.25	.08	.20
.5	.13	.27	.10	.22
.6	.15	.30	.12	.24
.7	.18	.32	.14	.26
.8	.21	.35	.16	.28
.9	.23	.38	.18	.30
1.0	.26	.40	.20	.32
1.1	.28	.43	.22	.34
1.2	.31	.45	.24	.36
1.3	.33	.48	.26	.38
1.4	.36	.50	.28	.40
1.5	.39	.53	.30	.42
1.6	.41	.56	.32	.44
1.7	.44	.58	.34	.46
1.8	.46	.61	.35	.48
1.9	.49	.63	.37	.50

Table 99

Norms for Thigh and Calf of Twelve-Year-Old Boys (Thigh = .4613 chest circumference + 2.1099 knee - 6.5970; calf = .2351 chest circumference + 2.0266 knee - 4.6654)

Chest Circumference, Centimeters		Knee Width, Centimeters																
		7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4
80	Th	45.50	45.92	46.34	46.76	47.19	47.61	48.03	48.45	48.87	49.30	49.72	50.14	50.56	50.93	51.41	51.83	52.25
	Ca	28.73	29.14	29.54	29.95	30.36	30.76	31.17	31.57	31.98	32.38	32.79	33.19	33.60	34.00	34.41	34.81	35.22
78	Th	44.58	45.00	45.42	45.84	46.26	46.69	47.11	47.53	47.95	48.37	48.80	49.22	49.64	50.06	50.48	50.91	51.33
	Ca	28.26	28.67	29.07	29.48	29.89	30.29	30.70	31.10	31.51	31.91	32.32	32.72	33.13	33.53	33.94	34.34	34.75
76	Th	43.65	44.08	44.50	44.92	45.34	45.76	46.18	46.61	47.03	47.45	47.87	48.29	48.72	49.14	49.56	49.98	50.40
	Ca	27.79	28.20	28.60	29.01	29.42	29.82	30.23	30.63	31.04	31.44	31.85	32.25	32.66	33.06	33.47	33.87	34.28
74	Th	42.73	43.15	43.57	44.00	44.42	44.84	45.26	45.68	46.11	46.53	46.95	47.37	47.79	48.22	48.64	49.06	49.48
	Ca	27.32	27.73	28.13	28.54	28.94	29.35	29.76	30.16	30.57	30.97	31.38	31.78	32.19	32.59	33.00	33.40	33.81
72	Th	41.81	42.23	42.65	43.07	43.50	43.92	44.34	44.76	45.18	45.61	46.03	46.45	46.87	47.29	47.72	48.14	48.56
	Ca	26.85	27.26	27.66	28.07	28.47	28.88	29.29	29.69	30.10	30.50	30.91	31.31	31.72	32.12	32.53	32.93	33.34
70	Th	40.89	41.31	41.73	42.15	42.57	43.00	43.42	43.84	44.26	44.68	45.11	45.53	45.95	46.37	46.79	47.21	47.64
	Ca	26.38	26.79	27.19	27.60	28.00	28.41	28.82	29.22	29.63	30.03	30.44	30.84	31.25	31.65	32.06	32.46	32.87
68	Th	39.96	40.38	40.81	41.23	41.65	42.07	42.49	42.92	43.34	43.76	44.18	44.60	45.03	45.45	45.87	46.29	46.71
	Ca	25.91	26.32	26.72	27.13	27.53	27.94	28.34	28.75	29.16	29.56	29.97	30.37	30.78	31.18	31.59	31.99	32.40
66	Th	39.04	39.46	39.88	40.31	40.73	41.15	41.57	41.99	42.42	42.84	43.26	43.68	44.10	44.53	44.95	45.37	45.79
	Ca	25.44	25.85	26.25	26.66	27.06	27.47	27.87	28.28	28.69	29.09	29.50	29.90	30.31	30.71	31.12	31.52	31.93
64	Th	38.12	38.54	38.96	39.38	39.81	40.23	40.65	41.07	41.49	41.92	42.34	42.76	43.18	43.60	44.03	44.45	44.87
	Ca	24.97	25.38	25.78	26.19	26.59	27.00	27.40	27.81	28.22	28.62	29.03	29.43	29.84	30.24	30.65	31.05	31.46
62	Th	37.19	37.62	38.04	38.46	38.88	39.30	39.73	40.15	40.57	40.99	41.41	41.84	42.26	42.68	43.10	43.52	43.95
	Ca	24.50	24.91	25.31	25.72	26.12	26.53	26.93	27.34	27.74	28.15	28.56	28.96	29.37	29.77	30.18	30.58	30.99
60	Th	36.27	36.69	37.12	37.54	37.96	38.38	38.80	39.23	39.65	40.07	40.49	40.91	41.34	41.76	42.18	42.60	43.02
	Ca	24.03	24.44	24.84	25.25	25.65	26.06	26.46	26.87	27.27	27.68	28.09	28.49	28.90	29.30	29.71	30.11	30.52
58	Th	35.35	35.77	36.19	36.62	37.04	37.46	37.88	38.30	38.73	39.15	39.57	39.99	40.41	40.84	41.26	41.68	42.10
	Ca	23.56	23.97	24.37	24.78	25.18	25.59	25.99	26.40	26.80	27.21	27.62	28.02	28.43	28.83	29.24	29.64	30.05
56	Th	34.43	34.85	35.27	35.69	36.12	36.54	36.96	37.38	37.80	38.22	38.65	39.07	39.49	39.91	40.33	40.76	41.18
	Ca	23.09	23.50	23.90	24.31	24.71	25.12	25.52	25.93	26.33	26.74	27.14	27.55	27.96	28.36	28.77	29.17	29.58
54	Th	33.50	33.93	34.35	34.77	35.19	35.61	36.04	36.46	36.88	37.30	37.72	38.15	38.57	38.99	39.41	39.83	40.26
	Ca	22.62	23.03	23.43	23.84	24.24	24.65	25.05	25.46	25.86	26.27	26.67	27.08	27.49	27.89	28.30	28.70	29.11

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.211	0	.203
.1	.046	.247	.024	.226
.2	.092	.303	.047	.250
.3	.138	.349	.071	.273
.4	.185	.396	.094	.297
.5	.231	.442	.118	.320
.6	.277	.488	.141	.344
.7	.323	.534	.165	.367
.8	.369	.580	.188	.391
.9	.415	.626	.212	.414
1.0	.461	.672	.235	.438
1.1	.507	.718	.259	.461
1.2	.554	.765	.282	.485
1.3	.600	.611	.306	.508
1.4	.646	.857	.329	.532
1.5	.692	.903	.353	.555
1.6	.738	.949	.376	.578
1.7	.784	.995	.400	.602
1.8	.830	1.041	.423	.627
1.9	.876	1.087	.447	.649

Table 100

Norms for Upper Arm and Forearm of Thirteen-Year-Old Boys (Upper arm = .2872 chest circumference + 1.1496 elbow - 5.7353; forearm = .2381 chest circumference + .7327 elbow + .5610)

Chest Circumference, Centimeters		Elbow Width, Centimeters														
		4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4
90	UA	25.40	25.63	25.86	26.09	26.32	26.55	26.78	27.01	27.24	27.47	27.70	27.93	28.16	28.38	28.62
	FA	25.36	25.51	25.65	25.80	25.95	26.09	26.24	26.39	26.53	26.68	26.83	26.97	27.12	27.27	27.41
88	UA	24.83	25.06	25.29	25.52	25.75	25.98	26.21	26.44	26.67	26.90	27.13	27.36	27.59	27.82	28.05
	FA	24.88	25.03	25.18	25.32	25.47	25.62	25.76	25.91	26.06	26.20	26.35	26.50	26.64	26.79	26.94
86	UA	24.25	24.48	24.71	24.94	25.17	25.40	25.63	25.86	26.09	26.32	26.55	26.78	27.01	27.24	27.47
	FA	24.41	24.55	24.70	24.85	24.99	25.14	25.29	25.43	25.58	25.73	25.87	26.02	26.17	26.31	26.46
84	UA	23.68	23.91	24.14	24.37	24.60	24.83	25.06	25.29	25.52	25.75	25.98	26.21	26.44	26.67	26.90
	FA	23.93	24.08	24.22	24.37	24.52	24.66	24.81	24.96	25.10	25.25	25.40	25.54	25.69	25.84	25.98
82	UA	23.10	23.33	23.56	23.79	24.02	24.25	24.48	24.71	24.94	25.17	25.40	25.63	25.86	26.09	26.32
	FA	23.46	23.60	23.75	23.90	24.04	24.19	24.33	24.48	24.63	24.77	24.92	25.07	25.21	25.36	25.51
80	UA	22.53	22.76	22.99	23.22	23.45	23.68	23.91	24.14	24.37	24.60	24.83	25.06	25.29	25.52	25.75
	FA	22.98	23.13	23.27	23.42	23.57	23.71	23.86	24.01	24.15	24.30	24.44	24.59	24.74	24.88	25.03
78	UA	21.95	22.18	22.41	22.64	22.87	23.10	23.33	23.56	23.79	24.02	24.25	24.48	24.71	24.94	25.17
	FA	22.50	22.65	22.80	22.94	23.09	23.24	23.38	23.53	23.68	23.82	23.97	24.12	24.26	24.41	24.55
76	UA	21.38	21.61	21.84	22.07	22.30	22.53	22.76	22.99	23.22	23.45	23.68	23.91	24.14	24.37	24.60
	FA	22.03	22.17	22.32	22.47	22.61	22.76	22.91	23.05	23.20	23.35	23.49	23.64	23.79	23.93	24.08
74	UA	20.81	21.04	21.27	21.50	21.73	21.96	22.19	22.42	22.65	22.87	23.10	23.33	23.56	23.79	24.02
	FA	21.55	21.70	21.94	21.99	22.14	22.28	22.43	22.58	22.72	22.37	23.02	23.16	23.31	23.46	23.60
72	UA	20.23	20.46	20.69	20.92	21.15	21.38	21.61	21.84	22.07	22.30	22.53	22.76	22.99	23.22	23.45
	FA	21.07	21.22	21.37	21.51	21.66	21.81	21.95	22.10	22.25	22.39	22.54	22.69	22.83	22.98	23.13
70	UA	19.66	19.89	20.12	20.35	20.58	20.81	21.04	21.27	21.50	21.73	21.96	22.19	22.42	22.65	22.88
	FA	20.60	20.74	20.89	21.04	21.18	21.33	21.48	21.62	21.77	21.92	22.06	22.21	22.36	22.50	22.65
68	UA	19.08	19.31	19.54	19.77	20.00	20.23	20.46	20.69	20.92	21.15	21.38	21.61	21.84	22.07	22.30
	FA	20.12	20.27	20.42	20.56	20.71	20.85	21.00	21.15	21.29	21.44	21.59	21.73	21.88	22.03	22.17
66	UA	18.51	18.74	18.97	19.20	19.43	19.66	19.89	20.12	20.35	20.58	20.81	21.04	21.27	21.50	21.73
	FA	19.65	19.79	19.94	20.09	20.23	20.38	20.53	20.67	20.82	20.96	21.11	21.26	21.40	21.55	21.70
64	UA	17.93	18.16	18.39	18.62	18.85	19.08	19.31	19.54	19.77	20.00	20.23	20.46	20.69	20.92	21.15
	FA	19.17	19.32	19.46	19.61	19.76	19.90	20.05	20.20	20.34	20.49	20.64	20.78	20.93	21.07	21.22
62	UA	17.36	17.59	17.82	18.05	18.28	18.51	18.74	18.97	19.20	19.43	19.66	19.89	20.12	20.35	20.58
	FA	18.69	18.84	18.99	19.13	19.28	19.43	19.57	19.72	19.87	20.01	20.16	20.31	20.45	20.60	20.75
60	UA	16.78	17.01	17.24	17.47	17.70	17.93	18.16	18.39	18.62	18.85	19.08	19.31	19.54	19.77	20.00
	FA	18.22	18.36	18.51	18.66	18.80	18.95	19.10	19.24	19.39	19.54	19.68	19.83	19.98	20.12	20.27
58	UA	16.21	16.44	16.67	16.90	17.13	17.36	17.59	17.82	18.05	18.28	18.51	18.74	18.97	19.20	19.43
	FA	17.74	17.88	18.03	18.18	18.33	18.47	18.62	18.77	18.91	19.06	19.21	19.35	19.50	19.65	19.79
56	UA	15.64	15.87	16.10	16.33	16.56	16.79	17.02	17.25	17.48	17.71	17.94	18.17	18.40	18.63	18.85
	FA	17.27	17.41	17.56	17.70	17.85	18.00	18.14	18.29	18.44	18.58	18.73	18.88	19.02	19.17	19.32
54	UA	15.06	15.29	15.52	15.75	15.98	16.21	16.44	16.67	16.90	17.13	17.36	17.59	17.82	18.05	18.28
	FA	16.79	16.94	17.08	17.23	17.37	17.52	17.67	17.81	17.96	18.11	18.25	18.40	18.55	18.69	18.84

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.115	0	.073
.1	.029	.144	.024	.097
.2	.057	.172	.048	.121
.3	.086	.201	.071	.145
.4	.115	.230	.095	.169
.5	.144	.259	.119	.192
.6	.172	.287	.143	.216
.7	.201	.316	.167	.240
.8	.230	.345	.190	.264
.9	.258	.373	.214	.288
1.0	.287	.402	.238	.311
1.1	.316	.431	.262	.335
1.2	.345	.460	.286	.359
1.3	.374	.488	.310	.383
1.4	.402	.517	.333	.407
1.5	.431	.546	.357	.430
1.6	.460	.574	.381	.454
1.7	.488	.603	.405	.478
1.8	.517	.632	.429	.502
1.9	.546	.661	.452	.526

Table 101

Norms for Thigh and Calf of Thirteen-Year-Old Boys (Thigh = .4091 chest circumference + 2.4994 knee - 12.2925; calf = .2830 chest circumference + 1.5980 knee - 3.8426)

Chest Circumference, Centimeters		Knee Width, Centimeters																				
		7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2
90	Th	49.72	50.22	50.72	51.22	51.72	52.22	52.72	53.22	53.72	54.22	54.72	55.22	55.72	56.22	56.72	57.22	57.72	58.22	58.72	59.22	59.72
	Ca	33.13	33.45	33.77	34.09	34.41	34.73	35.05	35.37	35.69	36.01	36.33	36.65	36.97	37.29	37.61	37.93	38.25	38.57	38.89	39.21	39.53
88	Th	48.74	49.24	49.74	50.24	50.74	51.24	51.74	52.24	52.74	53.24	53.74	54.24	54.74	55.24	55.74	56.24	56.74	57.24	57.74	58.24	58.74
	Ca	32.57	32.89	33.21	33.53	33.85	34.17	34.48	34.80	35.12	35.44	35.76	36.08	36.40	36.72	37.04	37.36	37.68	38.00	38.32	38.64	38.96
86	Th	47.77	48.27	48.77	49.27	49.77	50.27	50.77	51.26	51.76	52.26	52.76	53.26	53.76	54.26	54.76	55.26	55.76	56.26	56.76	57.26	57.76
	Ca	32.00	32.32	32.64	32.96	33.28	33.60	33.92	34.24	34.56	34.88	35.20	35.52	35.84	36.16	36.48	36.80	37.11	37.43	37.75	38.07	38.39
84	Th	46.79	47.29	47.79	48.29	48.79	49.29	49.79	50.29	50.79	51.29	51.79	52.29	52.79	53.29	53.79	54.29	54.79	55.29	55.79	56.29	56.79
	Ca	31.44	31.75	32.07	32.39	32.72	33.03	33.35	33.67	33.99	34.31	34.63	34.95	35.27	35.59	35.91	36.23	36.55	36.87	37.19	37.51	37.83
82	Th	45.81	46.31	46.81	47.31	47.81	48.31	48.81	49.31	49.81	50.31	50.81	51.31	51.81	52.31	52.81	53.31	53.81	54.31	54.81	55.31	55.81
	Ca	30.87	31.19	31.51	31.83	32.15	32.47	32.79	33.11	33.43	33.75	34.07	34.38	34.70	35.02	35.34	35.66	35.98	36.30	36.62	36.94	37.26
80	Th	44.83	45.33	45.83	46.33	46.83	47.33	47.83	48.33	48.83	49.33	49.83	50.33	50.83	51.33	51.83	52.33	52.83	53.33	53.83	54.33	54.83
	Ca	30.30	30.62	30.94	31.26	31.58	31.90	32.22	32.54	32.86	33.18	33.50	33.82	34.14	34.46	34.78	35.10	35.42	35.74	36.06	36.38	36.70
78	Th	43.85	44.35	44.85	45.35	45.85	46.35	46.85	47.35	47.85	48.35	48.85	49.35	49.85	50.35	50.85	51.35	51.85	52.35	52.85	53.35	53.85
	Ca	29.74	30.06	30.38	30.70	31.02	31.34	31.65	31.97	32.29	32.61	32.93	33.25	33.57	33.89	34.21	34.53	34.85	35.17	35.49	35.81	36.13
76	Th	42.87	43.37	43.87	44.37	44.87	45.37	45.87	46.37	46.87	47.37	47.87	48.37	48.87	49.37	49.87	50.37	50.87	51.37	51.87	52.37	52.87
	Ca	29.17	29.49	29.81	30.13	30.45	30.77	31.09	31.41	31.73	32.05	32.37	32.69	33.01	33.33	33.65	33.97	34.28	34.60	34.92	35.24	35.56
74	Th	41.90	42.40	42.90	43.40	43.90	44.40	44.90	45.40	45.90	46.40	46.90	47.40	47.90	48.40	48.89	49.39	49.89	50.39	50.89	51.39	51.89
	Ca	28.61	28.92	29.24	29.56	29.88	30.20	30.52	30.84	31.16	31.48	31.80	32.12	32.44	32.76	33.08	33.40	33.72	34.04	34.36	34.68	35.00
72	Th	40.92	41.42	41.92	42.42	42.92	43.42	43.92	44.42	44.92	45.42	45.92	46.42	46.92	47.42	47.92	48.42	48.92	49.42	49.92	50.42	50.92
	Ca	28.04	28.36	28.68	29.00	29.32	29.64	29.96	30.28	30.60	30.92	31.24	31.55	31.87	32.19	32.51	32.83	33.15	33.47	33.79	34.11	34.43
70	Th	39.94	40.44	40.94	41.44	41.94	42.44	42.94	43.44	43.94	44.44	44.94	45.44	45.94	46.44	46.94	47.44	47.94	48.44	48.94	49.44	49.94
	Ca	27.47	27.79	28.11	28.43	28.75	29.07	29.39	29.71	30.03	30.35	30.67	30.99	31.31	31.63	31.95	32.27	32.59	32.91	33.23	33.55	33.87
68	Th	38.96	39.46	39.96	40.46	40.96	41.46	41.96	42.46	42.96	43.46	43.96	44.46	44.96	45.46	45.96	46.46	46.96	47.46	47.96	48.46	48.96
	Ca	26.91	27.23	27.55	27.87	28.19	28.51	28.82	29.14	29.46	29.78	30.10	30.42	30.74	31.06	31.38	31.70	32.02	32.34	32.66	32.98	33.30
66	Th	37.98	38.48	38.98	39.48	39.98	40.48	40.98	41.48	41.98	42.48	42.98	43.48	43.98	44.48	44.98	45.48	45.98	46.48	46.98	47.48	47.98
	Ca	26.34	26.66	26.98	27.30	27.62	27.94	28.26	28.58	28.90	29.22	29.54	29.86	30.18	30.51	30.82	31.14	31.45	31.77	32.09	32.41	32.73
64	Th	37.01	37.51	38.01	38.51	39.01	39.50	40.00	40.50	41.00	41.50	42.00	42.50	43.00	43.50	44.00	44.50	45.00	45.50	46.00	46.50	47.00
	Ca	25.78	26.09	26.41	26.73	27.05	27.37	27.69	28.01	28.33	28.65	28.97	29.29	29.61	29.93	30.25	30.57	30.89	31.21	31.53	31.85	32.17
62	Th	36.03	36.53	37.03	37.53	38.03	38.53	39.03	39.53	40.03	40.53	41.03	41.53	42.03	42.53	43.03	43.53	44.03	44.53	45.03	45.53	46.02
	Ca	25.21	25.53	25.85	26.17	26.49	26.81	27.13	27.45	27.77	28.09	28.41	28.72	29.04	29.36	29.68	30.00	30.32	30.64	30.96	31.28	31.60
60	Th	35.05	35.55	36.05	36.55	37.05	37.55	38.05	38.55	39.05	39.55	40.05	40.55	41.05	41.55	42.05	42.55	43.05	43.55	44.05	44.55	45.05
	Ca	24.64	24.96	25.28	25.60	25.92	26.24	26.56	26.88	27.20	27.52	27.84	28.16	28.48	28.80	29.12	29.44	29.76	30.08	30.40	30.72	31.04
58	Th	34.07	34.57	35.07	35.57	36.07	36.57	37.07	37.57	38.07	38.57	39.07	39.57	40.07	40.57	41.07	41.57	42.07	42.57	43.07	43.57	44.07
	Ca	24.08	24.40	24.72	25.04	25.36	25.68	25.99	26.31	26.63	26.95	27.27	27.59	27.91	28.23	28.55	28.87	29.19	29.51	29.83	30.15	30.47
56	Th	33.09	33.59	34.09	34.59	35.09	35.59	36.09	36.59	37.09	37.59	38.09	38.59	39.09	39.59	40.09	40.59	41.09	41.59	42.09	42.59	43.09
	Ca	23.51	23.83	24.15	24.47	24.79	25.11	25.43	25.75	26.07	26.39	26.71	27.03	27.35	27.67	27.99	28.31	28.62	28.94	29.26	29.58	29.90
54	Th	32.11	32.61	33.11	33.61	34.11	34.61	35.11	35.61	36.11	36.61	37.11	37.61	38.11	38.61	39.11	39.61	40.11	40.61	41.11	41.61	42.11
	Ca	22.95	23.26	23.58	23.90	24.22	24.54	24.86	25.18	25.50	25.82	26.14	26.46	26.78	27.10	27.42	27.74	28.06	28.38	28.70	29.02	29.34

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.250	0	.160
.1	.049	.299	.028	.188
.2	.098	.348	.057	.217
.3	.147	.397	.085	.245
.4	.196	.446	.113	.273
.5	.245	.494	.142	.301
.6	.293	.543	.170	.330
.7	.342	.592	.198	.358
.8	.391	.641	.226	.386
.9	.440	.690	.255	.415
1.0	.489	.739	.283	.443
1.1	.538	.788	.311	.471
1.2	.587	.837	.340	.499
1.3	.636	.886	.368	.528
1.4	.685	.935	.396	.556
1.5	.734	.984	.425	.584
1.6	.783	1.033	.453	.613
1.7	.831	1.081	.481	.641
1.8	.880	1.130	.509	.669
1.9	.929	1.179	.538	.698

Table 102

Norms for Upper Arm and Forearm of Fourteen-Year-Old Boys (Upper arm = .3168 chest circumference + .6584 elbow - 5.0304; forearm = .2077 chest circumference + 1.4847 elbow - 1.8219)

Chest Circumference, Centimeters		Elbow Width, Centimeters																							
		5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5
92	UA	27.54	27.60	27.67	27.74	27.80	27.87	27.93	28.00	28.07	28.13	28.20	28.26	28.33	28.39	28.46	28.53	28.59	28.66	28.72	28.79	28.86	28.92	28.99	29.05
	FA	25.01	25.16	25.30	25.45	25.60	25.75	25.90	26.05	26.19	26.34	26.49	26.64	26.79	26.94	27.09	27.23	27.38	27.53	27.68	27.83	27.98	28.12	28.27	28.42
90	UA	26.91	26.97	27.04	27.10	27.17	27.23	27.30	27.37	27.43	27.50	27.56	27.63	27.70	27.76	27.83	27.89	27.96	28.02	28.09	28.16	28.22	28.29	28.35	28.42
	FA	24.59	24.74	24.89	25.04	25.19	25.33	25.48	25.63	25.78	25.93	26.08	26.22	26.37	26.52	26.67	26.82	26.97	27.12	27.26	27.41	27.56	27.71	27.86	28.01
88	UA	26.27	26.34	26.40	26.47	26.54	26.60	26.67	26.73	26.80	26.86	26.93	27.00	27.06	27.13	27.19	27.26	27.33	27.39	27.46	27.52	27.59	27.65	27.72	27.79
	FA	24.18	24.32	24.47	24.62	24.77	24.92	25.07	25.22	25.36	25.51	25.66	25.81	25.96	26.11	26.25	26.40	26.55	26.70	26.85	27.00	27.15	27.29	27.44	27.59
86	UA	25.64	25.70	25.77	25.84	25.90	25.97	26.03	26.10	26.16	26.23	26.30	26.36	26.43	26.49	26.56	26.63	26.69	26.76	26.82	26.89	26.95	27.02	27.09	27.15
	FA	23.76	23.91	24.06	24.21	24.35	24.50	24.65	24.80	24.95	25.10	25.25	25.39	25.54	25.69	25.84	25.99	26.14	26.28	26.43	26.58	26.73	26.88	27.03	27.18
84	UA	25.00	25.07	25.14	25.20	25.27	25.33	25.40	25.47	25.53	25.60	25.66	25.73	25.79	25.86	25.93	25.99	26.06	26.12	26.19	26.26	26.32	26.39	26.45	26.52
	FA	23.35	23.49	23.64	23.79	23.94	24.09	24.24	24.38	24.53	24.68	24.83	24.98	25.13	25.28	25.42	25.57	25.72	25.87	26.02	26.17	26.31	26.46	26.61	26.76
82	UA	24.37	24.44	24.50	24.57	24.63	24.70	24.77	24.83	24.90	24.96	25.03	25.10	25.16	25.23	25.29	25.36	25.42	25.49	25.56	25.62	25.69	25.75	25.82	25.89
	FA	22.93	23.08	23.23	23.38	23.52	23.67	23.82	23.97	24.12	24.27	24.41	24.56	24.71	24.86	25.01	25.16	25.31	25.45	25.60	25.75	25.90	26.05	26.20	26.34
80	UA	23.74	23.80	23.87	23.93	24.00	24.07	24.13	24.20	24.26	24.33	24.40	24.46	24.53	24.59	24.66	24.72	24.79	24.86	24.92	24.99	25.05	25.12	25.19	25.25
	FA	22.51	22.66	22.81	22.96	23.11	23.26	23.41	23.55	23.70	23.85	24.00	24.15	24.30	24.44	24.59	24.74	24.89	25.04	25.19	25.34	25.48	25.63	25.78	25.93
78	UA	23.10	23.17	23.24	23.30	23.37	23.43	23.50	23.56	23.63	23.70	23.76	23.83	23.89	23.96	24.03	24.09	24.16	24.22	24.29	24.35	24.42	24.49	24.55	24.62
	FA	22.10	22.25	22.40	22.54	22.69	22.84	22.99	23.14	23.29	23.44	23.58	23.73	23.88	24.03	24.18	24.33	24.47	24.62	24.77	24.92	25.07	25.22	25.37	25.51
76	UA	22.47	22.54	22.60	22.67	22.73	22.80	22.87	22.93	23.00	23.06	23.13	23.20	23.26	23.33	23.39	23.46	23.52	23.59	23.66	23.72	23.79	23.85	23.92	23.98
	FA	21.68	21.83	21.98	22.13	22.28	22.43	22.57	22.72	22.87	23.02	23.17	23.32	23.47	23.61	23.76	23.91	24.06	24.21	24.36	24.50	24.65	24.80	24.95	25.10
74	UA	21.84	21.90	21.97	22.03	22.10	22.17	22.23	22.30	22.36	22.43	22.49	22.56	22.63	22.69	22.76	22.82	22.89	22.96	23.02	23.09	23.15	23.22	23.28	23.35
	FA	21.27	21.42	21.57	21.71	21.86	22.01	22.16	22.31	22.46	22.60	22.75	22.90	23.05	23.20	23.35	23.50	23.64	23.79	23.94	24.09	24.24	24.39	24.53	24.68
72	UA	21.20	21.27	21.33	21.40	21.47	21.53	21.60	21.66	21.73	21.80	21.86	21.93	21.99	22.06	22.12	22.19	22.26	22.32	22.39	22.45	22.52	22.59	22.65	22.72
	FA	20.85	21.00	21.15	21.30	21.45	21.60	21.74	21.89	22.04	22.19	22.34	22.49	22.63	22.78	22.93	23.08	23.23	23.38	23.53	23.67	23.82	23.97	24.12	24.27
70	UA	20.57	20.64	20.70	20.77	20.83	20.90	20.96	21.03	21.10	21.16	21.23	21.29	21.36	21.43	21.49	21.56	21.62	21.69	21.75	21.82	21.87	21.95	22.02	22.08
	FA	20.44	20.59	20.73	20.88	21.03	21.18	21.33	21.48	21.63	21.77	21.92	22.07	22.22	22.37	22.52	22.66	22.81	22.96	23.11	23.26	23.41	23.56	23.70	23.85
68	UA	19.94	20.00	20.07	20.13	20.20	20.26	20.33	20.40	20.46	20.53	20.59	20.66	20.73	20.79	20.86	20.92	20.99	21.05	21.12	21.19	21.25	21.32	21.38	21.45
	FA	20.02	20.17	20.32	20.47	20.62	20.76	20.91	21.06	21.21	21.36	21.51	21.66	21.80	21.95	22.10	22.25	22.40	22.55	22.69	22.84	22.99	23.14	23.29	23.44
66	UA	19.30	19.37	19.43	19.50	19.57	19.63	19.70	19.76	19.83	19.89	19.96	20.03	20.09	20.16	20.22	20.29	20.36	20.42	20.49	20.55	20.62	20.68	20.75	20.82
	FA	19.61	19.76	19.90	20.05	20.20	20.35	20.50	20.65	20.79	20.94	21.09	21.24	21.39	21.54	21.69	21.83	21.98	22.13	22.28	22.43	22.58	22.72	22.87	23.02
64	UA	18.67	18.73	18.80	18.87	18.93	19.00	19.06	19.13	19.20	19.26	19.33	19.39	19.46	19.52	19.59	19.66	19.72	19.79	19.85	19.92	19.99	20.05	20.12	20.18
	FA	19.19	19.34	19.49	19.64	19.79	19.93	20.08	20.23	20.38	20.53	20.68	20.82	20.97	21.12	21.27	21.42	21.57	21.72	21.86	22.01	22.16	22.31	22.46	22.61
62	UA	18.03	18.10	18.17	18.23	18.30	18.36	18.43	18.50	18.56	18.63	18.69	18.76	18.82	18.89	18.96	19.02	19.09	19.15	19.22	19.29	19.35	19.42	19.48	19.55
	FA	18.78	18.92	19.07	19.22	19.37	19.52	19.67	19.82	19.96	20.11	20.26	20.41	20.56	20.71	20.85	21.00	21.15	21.30	21.45	21.60	21.75	21.89	22.04	22.19
60	UA	17.40	17.47	17.53	17.60	17.66	17.73	17.80	17.86	17.93	17.99	18.06	18.13	18.19	18.26	18.32	18.39	18.45	18.52	18.59	18.65	18.72	18.78	18.85	18.92
	FA	18.36	18.51	18.66	18.81	18.95	19.10	19.25	19.40	19.55	19.70	19.85	19.99	20.14	20.29	20.44	20.59	20.74	20.88	21.03	21.18	21.33	21.48	21.63	21.78

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Fore-arm
	0	0
0	0	0
.1	.032	.021
.2	.063	.042
.3	.095	.062
.4	.127	.083
.5	.158	.104
.6	.190	.125
.7	.222	.145
.8	.253	.166
.9	.285	.187
1.0	.317	.208
1.1	.348	.228
1.2	.380	.249
1.3	.412	.270
1.4	.444	.291
1.5	.475	.312
1.6	.507	.332
1.7	.539	.353
1.8	.570	.374
1.9	.602	.395

Table 103

Norms for Thigh and Calf of Fourteen-Year-Old Boys (Thigh = .4838 chest circumference + 2.0442 knee - 7.6907; calf = .2836 chest circumference + 1.7544 knee - 5.2291)

Chest Circumference, Centimeters		Knee Width, Centimeters																	
		7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2
92	Th	52.76	53.17	53.58	53.99	54.40	54.81	55.22	55.63	56.03	56.44	56.85	57.26	57.67	58.08	58.49	58.90	59.31	59.71
	Ca	34.55	34.90	35.25	35.60	35.95	36.30	36.65	37.00	37.35	37.70	38.06	38.41	38.76	39.11	39.46	39.81	40.16	40.51
90	Th	51.80	52.20	52.61	53.02	53.43	53.84	54.25	54.66	55.07	55.48	55.88	56.29	56.70	57.11	57.52	57.93	58.33	58.75
	Ca	33.98	34.33	34.68	35.03	35.38	35.73	36.08	36.44	36.79	37.14	37.49	37.84	38.19	38.54	38.89	39.24	39.59	39.94
88	Th	50.83	51.24	51.65	52.05	52.46	52.87	53.28	53.69	54.10	54.51	54.92	55.33	55.73	56.14	56.55	56.96	57.37	57.78
	Ca	33.41	33.76	34.11	34.46	34.82	35.17	35.52	35.87	36.22	36.57	36.92	37.27	37.62	37.97	38.32	38.68	39.03	39.38
86	Th	49.86	50.27	50.68	51.09	51.50	51.91	52.31	52.72	53.13	53.54	53.95	54.36	54.77	55.18	55.58	55.99	56.40	56.81
	Ca	32.84	33.20	33.55	33.90	34.25	34.60	34.95	35.30	35.65	36.00	36.35	36.70	37.06	37.41	37.76	38.11	38.46	38.81
84	Th	48.89	49.30	49.71	50.12	50.53	50.94	51.34	51.76	52.16	52.57	52.98	53.39	53.80	54.21	54.62	55.03	55.43	55.84
	Ca	32.28	32.63	32.98	33.33	33.68	34.03	34.38	34.73	35.08	35.44	35.79	36.14	36.49	36.84	37.19	37.54	37.89	38.24
82	Th	47.93	48.33	48.74	49.15	49.56	49.97	50.38	50.79	51.20	51.61	52.01	52.42	52.83	53.24	53.65	54.06	54.47	54.88
	Ca	31.71	32.06	32.41	32.76	33.11	33.46	33.82	34.17	34.52	34.87	35.22	35.57	35.92	36.27	36.62	36.97	37.32	37.68
80	Th	46.96	47.37	47.78	48.18	48.59	49.00	49.41	49.82	50.23	50.64	51.05	51.46	51.86	52.27	52.68	53.09	53.50	53.91
	Ca	31.14	31.49	31.84	32.20	32.55	32.90	33.25	33.60	33.95	34.30	34.65	35.00	35.35	35.70	36.06	36.41	36.76	37.11
78	Th	45.99	46.40	46.81	47.22	47.63	48.03	48.44	48.85	49.26	49.67	50.08	50.49	50.90	51.31	51.71	52.12	52.53	52.94
	Ca	30.58	30.93	31.28	31.63	31.98	32.33	32.68	33.03	33.38	33.73	34.08	34.44	34.79	35.14	35.49	35.84	36.19	36.54
76	Th	45.02	45.43	45.84	46.25	46.66	47.07	47.48	47.88	48.29	48.70	49.11	49.52	49.93	50.34	50.75	51.16	51.56	51.97
	Ca	30.01	30.36	30.70	31.06	31.41	31.76	32.11	32.46	32.82	33.17	33.52	33.87	34.22	34.57	34.92	35.27	35.62	35.97
74	Th	44.06	44.46	44.87	45.28	45.69	46.10	46.51	46.92	47.33	47.73	48.14	48.55	48.96	49.37	49.78	50.19	50.60	51.01
	Ca	29.44	29.79	30.14	30.49	30.85	31.20	31.55	31.90	32.25	32.60	32.95	33.30	33.65	34.00	34.35	34.70	35.06	35.41
72	Th	43.09	43.50	43.91	44.31	44.72	45.13	45.54	45.95	46.36	46.77	47.18	47.58	47.99	48.40	48.81	49.22	49.63	50.04
	Ca	28.87	29.23	29.58	29.93	30.28	30.63	30.98	31.33	31.68	32.03	32.38	32.73	33.08	33.44	33.79	34.14	34.49	34.84
70	Th	42.12	42.53	42.94	43.35	43.76	44.16	44.57	44.98	45.39	45.80	46.21	46.62	47.03	47.43	47.84	48.25	48.66	49.07
	Ca	28.31	28.66	29.01	29.36	29.71	30.06	30.41	30.76	31.11	31.47	31.82	32.17	32.52	32.87	33.22	33.57	33.92	34.27
68	Th	41.15	41.56	41.97	42.38	42.79	43.20	43.61	44.01	44.42	44.83	45.24	45.65	46.06	46.47	46.88	47.29	47.69	48.10
	Ca	27.74	28.09	28.44	28.79	29.14	29.49	29.85	30.20	30.55	30.90	31.25	31.60	31.95	32.30	32.65	33.00	33.36	33.70
66	Th	40.18	40.59	41.00	41.41	41.82	42.23	42.64	43.05	43.46	43.86	44.27	44.68	45.09	45.50	45.91	46.32	46.73	47.14
	Ca	27.17	27.52	27.87	28.23	28.58	28.93	29.28	29.63	29.98	30.33	30.68	31.03	31.38	31.73	32.09	32.44	32.79	33.14
64	Th	39.22	39.63	40.03	40.44	40.85	41.26	41.67	42.08	42.49	42.90	43.31	43.71	44.12	44.53	44.94	45.35	45.76	46.17
	Ca	26.61	26.96	27.31	27.66	28.01	28.36	28.71	29.06	29.41	29.76	30.11	30.47	30.82	31.17	31.52	31.87	32.21	32.57
62	Th	38.25	38.66	39.07	39.48	39.89	40.29	40.70	41.11	41.52	41.93	42.34	42.75	43.16	43.56	43.97	44.38	44.79	45.20
	Ca	26.04	26.39	26.74	27.09	27.44	27.79	28.14	28.49	28.85	29.20	29.55	29.90	30.25	30.60	30.95	31.30	31.65	32.00
60	Th	37.28	37.69	38.10	38.51	38.92	39.33	39.74	40.14	40.55	40.96	41.37	41.78	42.19	42.60	43.01	43.41	43.82	44.23
	Ca	25.47	25.82	26.17	26.52	26.87	27.23	27.58	27.93	28.28	28.63	28.98	29.33	29.68	30.03	30.38	30.73	31.09	31.44

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.204	0	.175
.1	.048	.253	.028	.204
.2	.097	.301	.057	.232
.3	.145	.350	.085	.261
.4	.194	.398	.113	.289
.5	.242	.446	.142	.317
.6	.290	.495	.170	.346
.7	.339	.543	.199	.374
.8	.387	.591	.227	.402
.9	.435	.640	.255	.431
1.0	.484	.688	.284	.459
1.1	.532	.737	.312	.487
1.2	.581	.785	.340	.516
1.3	.629	.833	.369	.544
1.4	.677	.882	.397	.572
1.5	.726	.930	.425	.601
1.6	.774	.979	.454	.629
1.7	.822	1.027	.482	.658
1.8	.871	1.075	.510	.686
1.9	.919	1.124	.539	.714

Table 104

Norms for Upper Arm and Forearm of Fifteen-Year-Old Boys (Upper arm =.2962 chest circumference + 1.0698 elbow -6.1911; forearm = .1761 chest circumference + 1.7587 elbow - 1. 0759)

Chest Circumference, Centimeters		Elbow Width, Centimeters														
		5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0
94	UA	27.21	27.43	27.64	27.86	28.07	28.28	28.50	28.71	28.93	29.14	29.35	29.57	29.78	30.00	30.21
	FA	24.62	24.97	25.33	25.68	26.03	26.38	26.73	27.08	27.44	27.79	28.14	28.49	28.84	29.20	29.55
92	UA	26.62	26.84	27.05	27.26	27.48	27.69	27.91	28.12	28.33	28.55	28.76	28.98	29.19	29.40	29.62
	FA	24.27	24.62	24.97	25.33	25.68	26.03	26.38	26.73	27.08	27.44	27.79	28.14	28.49	28.84	29.19
90	UA	26.03	26.24	26.46	26.67	26.89	27.10	27.31	27.53	27.74	27.96	28.17	28.38	28.60	28.81	29.03
	FA	23.92	24.27	24.62	24.97	25.33	25.68	26.03	26.38	26.73	27.08	27.44	27.79	28.14	28.49	28.84
88	UA	25.44	25.65	28.87	26.08	26.29	26.51	26.72	26.94	27.15	27.36	27.58	27.79	28.00	28.22	28.43
	FA	23.57	23.92	24.27	24.62	24.97	25.32	25.68	26.03	26.38	26.73	27.08	27.44	27.79	28.14	28.49
86	UA	24.85	25.06	25.27	25.49	25.70	25.91	26.13	26.34	26.56	26.77	26.98	27.20	27.41	27.63	27.84
	FA	23.21	23.57	23.92	24.27	24.62	24.97	25.32	25.68	26.03	26.38	26.73	27.08	27.43	27.79	28.14
84	UA	24.25	24.47	24.68	24.89	25.11	25.32	25.54	25.75	24.96	26.18	26.39	26.61	26.82	27.03	27.25
	FA	22.86	23.21	23.57	23.92	24.27	24.62	24.97	25.32	25.68	26.03	26.38	26.73	27.08	27.43	27.79
82	UA	23.66	23.87	24.09	24.30	24.52	24.73	24.94	25.16	25.37	25.59	25.80	26.01	26.23	26.44	26.66
	FA	22.51	22.86	23.21	23.56	23.92	24.27	24.62	24.97	25.32	25.68	26.03	26.38	26.73	27.08	27.43
80	UA	23.07	23.28	23.50	23.71	23.92	24.14	24.35	24.57	24.78	24.99	25.21	25.42	25.64	25.85	26.06
	FA	22.16	22.51	22.86	23.21	23.56	23.92	24.27	24.62	24.97	25.32	25.67	26.03	26.38	26.73	27.08
78	UA	22.48	22.69	22.90	23.12	23.33	23.55	23.76	23.97	24.19	24.40	24.62	24.83	25.04	25.26	25.47
	FA	21.81	22.16	22.51	22.86	23.21	23.56	23.92	24.27	24.62	24.97	25.32	25.67	26.03	26.38	26.73
76	UA	21.88	22.10	22.31	22.52	22.74	22.95	23.17	23.38	23.59	23.81	24.02	24.24	24.45	24.66	24.88
	FA	21.45	21.80	22.16	22.51	22.86	23.21	23.56	23.92	24.27	24.62	24.97	25.32	25.67	26.03	26.38
74	UA	21.29	21.50	21.72	21.93	22.15	22.36	22.57	22.79	23.00	23.22	23.43	23.64	23.86	24.07	24.29
	FA	21.10	21.45	21.80	22.16	22.51	22.86	23.21	23.56	23.91	24.27	24.62	24.97	25.32	25.67	26.03
72	UA	20.70	20.91	21.13	21.34	21.55	21.77	21.98	22.20	22.41	22.62	22.84	23.05	23.27	23.48	23.69
	FA	20.75	21.10	21.45	21.80	22.16	22.51	22.86	23.21	23.56	23.91	24.27	24.62	24.97	25.32	25.67
70	UA	20.11	20.32	20.54	20.75	20.96	21.18	21.39	21.61	21.82	22.03	22.25	22.46	22.68	22.89	23.10
	FA	20.40	20.75	21.10	21.45	21.80	22.16	22.51	22.86	23.21	23.56	23.91	24.27	24.62	24.97	25.32
68	UA	19.51	19.73	19.94	20.16	20.37	20.59	20.80	21.01	21.23	21.44	21.66	21.87	22.08	22.30	22.51
	FA	20.04	20.40	20.75	21.10	21.45	21.80	22.15	22.51	22.86	23.21	23.56	23.91	24.27	24.62	24.97
66	UA	18.92	19.14	19.35	19.57	19.78	19.99	20.21	20.42	20.63	20.85	21.06	21.28	21.49	21.70	21.92
	FA	19.69	20.04	20.40	20.75	21.10	21.45	21.80	22.15	22.51	22.86	23.21	23.56	23.91	24.26	24.62
64	UA	18.33	18.54	18.76	18.97	19.19	19.40	19.61	19.83	20.04	20.26	20.47	20.68	20.90	21.11	21.33
	FA	19.34	19.69	20.04	20.39	20.75	21.10	21.45	21.80	22.15	22.51	22.86	23.21	23.56	23.91	24.26
62	UA	17.74	17.95	18.16	18.38	18.59	18.81	19.02	19.23	19.45	19.66	19.88	20.09	20.30	20.52	20.73
	FA	18.99	19.34	19.69	20.04	20.39	20.75	21.10	21.45	21.80	22.15	22.50	22.86	23.21	23.56	23.91

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.107	0	.176
.1	.030	.136	.018	.193
.2	.059	.166	.035	.211
.3	.089	.196	.053	.229
.4	.118	.225	.070	.246
.5	.148	.255	.088	.264
.6	.178	.285	.106	.282
.7	.207	.314	.123	.299
.8	.237	.344	.141	.317
.9	.267	.374	.158	.334
1.0	.296	.403	.176	.352
1.1	.326	.433	.194	.370
1.2	.355	.462	.211	.387
1.3	.385	.492	.229	.405
1.4	.415	.522	.247	.422
1.5	.444	.551	.264	.440
1.6	.474	.581	.282	.458
1.7	.504	.611	.299	.475
1.8	.533	.640	.317	.493
1.9	.562	.670	.335	.510

Table 105

Norms for Thigh and Calf of Fifteen-Year-Old Boys (Thigh = .4659 chest circumference + 2.5999 knee - 11.9225; calf = .1657 chest circumference + 2.3674 knee - 1.9811)

Chest Circumference, Centimeters		Knee Width, Centimeters																	
		7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2
94	Th	52.15	52.67	53.19	53.71	54.23	54.75	55.27	55.79	56.31	56.83	57.35	57.87	58.39	58.91	59.43	59.95	60.47	60.99
	Ca	32.06	32.53	33.01	33.48	33.95	34.43	34.90	35.37	35.85	36.32	36.80	37.27	37.74	38.22	38.69	39.16	39.64	40.11
92	Th	51.22	51.74	52.26	52.78	53.30	53.82	54.34	54.86	55.38	55.90	56.42	56.94	57.46	57.98	58.50	59.02	59.54	60.06
	Ca	31.73	32.20	32.68	33.15	33.62	34.10	34.57	35.04	35.52	35.99	36.46	36.94	37.41	37.88	38.36	38.83	39.30	39.78
90	Th	50.29	50.81	51.33	51.85	52.37	52.89	53.41	53.93	54.45	54.97	55.49	56.01	56.53	57.05	57.57	58.09	58.61	59.13
	Ca	31.40	31.87	32.34	32.82	33.29	33.77	34.24	34.71	35.19	35.66	36.13	36.61	37.08	37.55	38.03	38.50	38.97	39.45
88	Th	49.36	49.88	50.40	50.92	51.44	51.96	52.48	53.00	53.52	54.04	54.56	55.08	55.60	56.12	56.64	57.15	57.68	58.20
	Ca	31.07	31.54	32.01	32.49	32.96	33.43	33.91	34.38	34.85	35.33	35.80	36.27	36.75	37.22	37.69	38.17	38.64	39.12
86	Th	48.42	48.94	49.46	49.98	50.50	51.02	51.54	52.06	52.58	53.10	53.62	54.14	54.66	55.18	55.70	56.22	56.74	57.26
	Ca	30.74	31.21	31.68	32.16	32.63	33.10	33.58	34.05	34.52	35.00	35.47	35.94	36.42	36.89	37.36	37.84	38.31	38.78
84	Th	47.49	48.01	48.53	49.05	49.57	50.09	50.61	51.13	51.65	52.17	52.69	53.21	53.73	54.25	54.77	55.29	55.81	56.33
	Ca	30.40	30.88	31.35	31.82	32.30	32.77	33.24	33.72	34.19	34.66	35.14	35.61	36.09	36.56	37.03	37.51	37.98	38.45
82	Th	46.56	47.08	47.60	48.12	48.64	49.16	49.68	50.20	50.72	51.24	51.76	52.28	52.80	53.32	53.84	54.36	54.88	55.40
	Ca	30.07	30.55	31.02	31.49	31.97	32.44	32.91	33.39	33.86	34.33	34.81	35.28	35.75	36.23	36.70	37.17	37.65	38.12
80	Th	45.63	46.15	46.67	47.19	47.71	48.23	48.75	49.27	49.79	50.31	50.83	51.35	51.87	53.39	52.91	53.43	53.95	54.47
	Ca	29.74	30.21	30.69	31.16	31.63	32.11	32.58	33.05	33.53	34.00	34.48	34.95	35.42	35.90	36.37	36.84	37.32	37.79
78	Th	44.70	45.22	45.74	46.26	46.78	47.30	47.82	48.34	48.86	49.38	49.90	50.42	50.94	51.46	51.98	52.50	53.02	53.54
	Ca	29.41	29.88	30.36	30.83	31.30	31.78	32.25	32.72	33.20	33.67	34.14	34.62	35.09	35.56	36.04	36.51	36.98	37.46
76	Th	43.77	44.29	44.81	45.33	45.85	46.37	46.89	47.40	47.92	48.44	48.96	49.48	50.00	50.52	51.04	51.56	52.08	52.60
	Ca	29.08	29.55	30.02	30.50	30.97	31.45	31.92	32.39	32.87	33.34	33.81	34.29	34.76	35.23	35.71	36.18	36.65	37.13
74	Th	42.83	43.34	43.87	44.39	44.91	45.43	45.95	46.47	46.99	47.51	48.03	48.55	49.07	49.59	50.11	50.63	51.15	51.67
	Ca	28.75	29.22	29.69	30.17	30.64	31.11	31.59	32.06	32.53	33.01	33.48	33.95	34.43	34.90	35.38	35.85	36.32	36.80
72	Th	41.90	42.42	42.94	43.46	43.98	44.50	45.02	45.54	46.06	46.58	47.10	47.62	48.14	48.66	49.18	49.70	50.22	50.74
	Ca	28.42	28.89	29.36	29.84	30.31	30.78	31.26	31.73	32.20	32.68	33.15	33.62	34.10	34.57	35.04	35.52	35.99	36.46
70	Th	40.97	41.49	42.01	42.53	43.05	43.57	44.09	44.61	45.13	45.65	46.17	46.69	47.21	47.73	48.25	48.77	49.29	49.81
	Ca	28.08	28.56	29.03	29.50	29.98	30.45	30.92	31.40	31.87	32.34	32.82	33.29	33.77	34.24	34.71	35.19	35.66	36.13
68	Th	40.04	40.56	41.08	41.60	42.12	42.64	43.16	43.68	44.20	44.72	45.24	45.76	46.28	46.80	47.32	47.84	48.36	48.88
	Ca	27.75	28.23	28.70	29.17	29.65	30.12	30.59	31.07	31.54	32.01	32.49	32.96	33.43	33.91	34.38	34.85	35.33	35.80
66	Th	39.11	39.63	40.15	40.67	41.19	41.71	42.23	42.75	43.27	43.79	44.31	44.83	45.35	45.87	46.39	46.91	47.43	47.95
	Ca	27.42	27.89	28.37	28.84	29.31	29.79	30.26	30.74	31.21	31.68	32.16	32.63	33.10	33.58	34.05	34.52	35.00	35.47
64	Th	38.17	38.69	39.21	39.73	40.25	40.77	41.29	41.81	42.33	42.85	43.37	43.89	44.41	44.93	45.45	45.97	46.49	47.01
	Ca	27.09	27.56	28.04	28.51	28.98	29.46	29.93	30.40	30.88	31.35	31.82	32.30	32.77	33.24	33.72	34.19	34.67	35.14
62	Th	37.24	37.76	38.28	38.80	39.32	39.84	40.36	40.88	41.40	41.92	42.44	42.96	43.48	44.00	44.52	45.04	45.56	46.08
	Ca	26.76	27.23	27.70	28.18	28.65	29.13	29.60	30.07	30.55	31.02	31.49	31.97	32.44	32.91	33.39	33.86	34.33	34.81

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.260	0	.237
.1	.047	.307	.017	.253
.2	.093	.353	.033	.270
.3	.140	.400	.050	.286
.4	.186	.446	.066	.303
.5	.233	.493	.083	.320
.6	.280	.540	.099	.336
.7	.326	.586	.116	.353
.8	.373	.633	.133	.369
.9	.419	.679	.149	.386
1.0	.466	.726	.166	.402
1.1	.512	.772	.182	.419
1.2	.559	.819	.199	.436
1.3	.606	.866	.215	.452
1.4	.652	.912	.232	.469
1.5	.699	.959	.249	.485
1.6	.745	1.005	.265	.502
1.7	.792	1.052	.282	.518
1.8	.839	1.099	.298	.535
1.9	.885	1.145	.315	.552

Table 106

Norms for Upper Arm and Forearm of Sixteen-Year-Old Boys (Upper arm = .2660 chest circumference + 1.1152 elbow - 4.2448; forearm = .1843 chest circumference + 1.8716 elbow - 2.3435)

Chest Circumference, Centimeters		Elbow Width, Centimeters																						
		5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8
96	UA	27.54	27.65	27.76	27.87	27.98	28.09	28.21	28.32	28.43	28.54	28.65	28.76	28.87	28.99	29.10	29.21	29.32	29.43	29.54	29.66	29.77	29.88	29.99
	FA	25.83	26.02	26.20	26.39	26.58	26.77	26.95	27.14	27.33	27.51	27.70	27.89	28.08	28.26	28.45	28.64	28.82	29.01	29.20	29.39	29.57	29.76	29.95
94	UA	27.00	27.12	27.23	27.34	27.45	27.56	27.67	27.78	27.90	28.01	28.12	28.23	28.34	28.45	28.57	28.68	28.79	28.90	29.01	29.12	29.23	29.35	29.46
	FA	25.46	25.65	25.34	26.02	26.21	26.40	26.58	26.77	26.96	27.15	27.33	27.52	27.71	27.89	28.08	28.27	28.46	28.64	28.83	29.02	29.20	29.39	29.58
92	UA	26.47	26.58	26.70	26.81	26.92	27.03	27.14	27.25	27.36	27.48	27.59	27.70	27.81	27.92	28.03	28.15	28.26	28.37	28.48	28.59	28.70	28.81	28.93
	FA	25.09	25.28	25.47	25.65	25.84	26.03	26.22	26.40	26.59	26.78	26.96	27.15	27.54	27.53	27.71	27.90	28.09	28.27	28.46	28.65	28.94	29.02	29.21
90	UA	25.94	26.05	26.16	26.27	26.39	26.50	26.61	26.72	26.93	26.94	27.06	27.17	27.28	27.39	27.50	27.61	27.72	27.84	27.95	28.06	28.17	28.28	28.39
	FA	24.72	24.91	25.10	25.29	25.47	25.66	25.85	26.04	26.22	26.41	26.60	26.78	26.97	27.16	27.34	27.53	27.72	27.91	28.09	28.28	28.47	28.65	28.84
88	UA	25.41	25.52	25.63	25.74	25.85	25.97	26.08	26.19	26.30	26.41	26.52	26.64	26.75	26.86	26.97	27.08	27.19	27.30	27.42	27.53	27.64	27.75	27.86
	FA	24.36	24.54	24.73	24.92	25.10	25.29	25.48	25.67	25.85	26.04	26.23	26.41	26.60	26.79	26.98	27.16	27.35	27.54	27.72	27.91	28.10	28.29	28.47
86	UA	24.98	24.99	25.10	25.21	25.32	25.43	25.55	25.66	25.77	25.88	25.99	26.10	26.21	26.33	26.44	26.55	26.66	26.77	26.88	27.00	27.11	27.22	27.33
	FA	23.99	24.17	24.36	24.55	24.74	24.92	25.11	25.30	25.48	25.67	25.86	26.05	26.23	26.42	26.61	26.79	26.98	27.17	27.36	27.54	27.73	27.92	28.10
84	UA	24.34	24.46	24.57	24.68	24.79	24.90	25.01	25.12	25.24	25.35	25.46	25.57	25.68	25.79	25.91	26.02	26.13	26.24	26.35	26.46	26.57	26.69	26.80
	FA	23.62	23.81	23.99	24.18	24.37	24.55	24.74	24.93	25.12	25.30	25.49	25.68	25.86	26.05	26.24	26.43	26.61	26.80	26.99	27.17	27.36	27.55	27.74
82	UA	23.81	23.92	24.04	24.15	24.26	24.37	24.48	24.59	24.70	24.82	24.93	25.04	25.15	25.26	25.37	25.49	25.60	25.71	25.82	25.93	26.04	26.15	26.27
	FA	23.25	23.44	23.62	23.81	24.00	24.19	24.37	24.56	24.75	24.93	25.12	25.31	25.50	25.68	25.87	26.06	26.24	26.43	26.62	26.81	26.99	27.18	27.37
80	UA	23.28	23.39	23.50	23.61	23.73	23.84	23.95	24.06	24.17	24.28	24.40	24.51	24.62	24.73	24.84	24.95	25.06	25.18	25.29	25.40	25.51	25.62	25.73
	FA	22.88	23.07	23.26	23.44	23.63	23.82	24.00	24.19	24.38	24.57	24.75	24.94	25.13	25.31	25.50	25.69	25.88	26.06	26.25	26.44	26.62	26.81	27.00
78	UA	22.75	22.96	22.97	23.08	23.19	23.31	23.42	23.53	23.64	23.75	23.86	23.98	24.09	24.20	24.31	24.42	24.53	24.64	24.76	24.87	24.98	25.09	25.20
	FA	22.51	22.70	22.89	23.07	23.26	23.45	23.64	23.82	24.01	24.20	24.38	24.57	24.76	24.95	25.13	25.32	25.51	25.69	25.88	26.07	26.26	26.44	26.63
76	UA	22.22	22.33	22.44	22.55	22.66	22.77	22.89	23.00	23.11	23.22	23.33	23.44	23.55	23.67	23.78	23.89	24.00	24.11	24.22	24.34	24.45	24.56	24.67
	FA	22.14	22.33	22.52	22.71	22.89	23.08	23.27	23.45	23.64	23.83	24.02	24.20	24.39	24.58	24.76	24.95	25.14	25.33	25.51	25.70	25.89	26.07	26.26
74	UA	21.68	21.80	21.91	22.02	22.13	22.24	22.35	22.46	22.58	22.69	22.80	22.91	23.02	23.13	23.24	23.36	23.47	23.58	23.69	23.80	23.91	24.03	24.14
	FA	21.78	21.96	22.15	22.34	22.52	22.71	22.90	23.09	23.27	23.46	23.65	23.83	24.02	24.21	24.40	24.58	24.77	24.96	25.14	25.33	25.52	25.71	25.89
72	UA	21.15	21.26	21.38	21.49	21.60	21.71	21.82	21.93	22.04	22.16	22.27	22.38	22.49	22.60	22.71	22.83	22.94	23.05	23.16	23.27	23.38	23.49	23.61
	FA	21.41	21.59	21.78	21.97	22.16	22.34	22.53	22.72	22.90	23.09	23.28	23.47	23.65	23.84	24.03	24.21	24.40	24.59	24.78	21.96	25.15	25.34	25.52
70	UA	20.62	20.73	20.84	20.95	21.07	21.18	21.29	21.40	21.51	21.62	21.74	21.85	21.96	22.07	22.18	22.29	22.40	22.52	22.63	22.74	22.85	22.96	23.07
	FA	21.04	21.23	21.41	21.60	21.79	21.97	22.16	22.35	22.54	22.72	22.91	23.10	23.28	23.47	23.66	23.85	24.03	24.22	24.41	24.59	24.78	24.07	25.16
68	UA	20.09	20.20	20.31	20.42	20.53	20.65	20.76	20.87	20.98	21.09	21.20	21.31	21.43	21.54	21.65	21.76	21.87	21.98	22.10	22.21	22.32	22.43	22.54
	FA	20.67	20.96	21.04	21.23	21.42	21.61	21.79	21.98	22.17	22.35	22.54	22.73	22.92	23.10	23.29	23.48	23.66	23.85	24.04	24.23	24.41	24.60	24.79
66	UA	19.56	19.67	19.78	19.89	20.00	20.11	20.23	20.34	20.45	20.56	20.67	20.78	20.89	21.01	21.12	21.23	21.34	21.45	21.56	21.68	21.79	21.90	22.01
	FA	20.30	20.49	20.68	20.86	21.05	21.24	21.42	21.61	21.80	21.99	22.17	22.36	22.55	22.73	22.92	23.11	23.30	23.48	23.67	23.86	24.04	24.23	24.42
64	UA	19.02	19.14	19.25	19.36	19.47	19.58	19.69	19.80	19.92	20.03	20.14	20.25	20.36	20.47	20.59	27.70	20.81	20.92	21.03	21.14	21.25	21.37	21.48
	FA	19.93	20.12	20.31	20.49	20.68	20.87	21.06	21.24	21.43	21.62	21.80	21.99	22.18	22.37	22.55	22.74	22.93	23.11	23.30	23.49	23.68	23.86	24.05

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	1	0	1
0	0	.112	0	.187
.1	.027	.138	.018	.206
.2	.053	.165	.037	.224
.3	.080	.191	.055	.242
.4	.106	.218	.074	.261
.5	.133	.245	.092	.279
.6	.160	.271	.111	.298
.7	.186	.298	.129	.316
.8	.213	.324	.147	.335
.9	.239	.351	.166	.353
1.0	.266	.378	.184	.371
1.1	.293	.404	.203	.390
1.2	.319	.431	.221	.408
1.3	.346	.457	.240	.427
1.4	.372	.484	.258	.445
1.5	.399	.511	.276	.464
1.6	.426	.537	.295	.482
1.7	.452	.564	.313	.500
1.8	.479	.590	.332	.519
1.9	.505	.617	.350	.537

Table 107

Norms for Thigh and Calf of Sixteen-Year-Old Boys (Thigh = .4774 chest circumference + 2.1905 knee - 9.2362; calf = .1951 chest circumference + 1.7872 knee + 1.3643)

Chest Circumference, Centimeters		Knee Width, Centimeters														
		8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0
96	Th	54.56	54.99	55.43	55.87	56.31	56.75	57.18	57.62	58.06	58.50	58.94	59.38	59.81	60.25	60.69
	Ca	54.75	35.11	35.46	35.82	36.18	36.54	36.89	37.25	37.61	37.97	38.32	38.68	39.04	39.40	39.75
94	Th	53.60	54.04	54.48	54.92	55.35	55.79	56.23	56.67	57.11	57.54	57.98	58.42	58.86	59.30	59.73
	Ca	34.36	34.72	35.07	35.43	35.78	36.15	36.50	36.86	37.22	37.58	37.93	38.29	38.64	39.01	39.36
92	Th	52.65	53.08	53.52	53.96	54.40	54.84	55.28	55.71	56.15	56.59	57.03	57.47	57.90	58.34	58.78
	Ca	33.97	34.33	34.68	35.04	35.40	35.76	36.11	36.47	36.83	37.19	37.54	37.90	38.26	38.62	38.97
90	Th	51.69	52.13	52.57	53.01	53.44	53.88	54.32	54.76	55.20	55.63	56.07	66.51	56.95	57.39	57.83
	Ca	33.58	33.94	34.29	34.65	35.01	35.37	35.72	36.08	36.44	36.80	37.15	37.51	37.87	38.22	38.58
88	Th	50.74	51.18	51.61	52.05	52.49	52.93	53.37	53.80	54.24	54.68	55.12	55.56	55.99	56.43	56.87
	Ca	33.19	33.55	33.90	34.26	34.62	34.98	35.33	35.69	36.05	36.40	36.76	37.12	37.48	37.83	38.19
86	Th	49.78	50.22	50.66	51.10	51.53	51.97	52.41	52.85	53.29	53.73	54.16	54.60	55.04	55.48	55.92
	Ca	32.80	33.16	33.51	33.87	34.23	34.59	34.94	35.30	35.66	36.01	36.37	36.73	37.09	37.44	37.80
84	Th	48.83	49.27	49.70	50.14	50.58	51.02	51.46	51.89	52.33	52.77	53.21	53.65	54.08	54.52	54.96
	Ca	32.41	32.76	33.12	33.48	33.84	34.20	34.55	34.91	35.27	35.62	35.96	36.34	36.70	37.05	37.41
82	Th	47.87	48.31	48.75	49.19	49.63	50.06	50.50	50.94	51.38	51.82	52.25	52.69	53.13	53.57	54.01
	Ca	32.02	32.38	32.73	33.09	33.45	33.80	34.16	34.52	34.88	35.23	35.59	35.95	36.31	36.66	37.02
80	Th	46.92	47.36	47.79	48.23	48.67	49.11	49.55	49.98	50.42	50.86	51.30	51.74	52.18	52.61	53.05
	Ca	31.63	31.98	32.34	32.70	33.06	33.41	33.77	34.13	34.49	34.84	35.20	35.56	35.92	36.27	36.63
78	Th	45.96	46.40	46.84	47.28	47.72	48.15	48.59	49.03	49.47	49.91	50.34	50.78	51.22	51.66	52.10
	Ca	31.24	31.59	31.95	32.31	32.67	33.02	33.38	33.74	34.10	34.45	34.81	35.17	35.53	35.88	36.24
76	Th	45.01	45.45	45.88	46.32	46.76	47.20	47.64	48.08	48.51	48.95	49.39	49.83	50.27	50.70	51.14
	Ca	30.85	31.20	31.56	31.92	32.28	32.63	32.99	33.35	33.71	34.06	34.42	34.78	35.14	35.49	35.85
74	Th	44.05	44.49	44.93	45.37	45.81	46.24	46.68	47.12	47.56	48.00	48.43	48.87	49.31	49.75	50.19
	Ca	30.46	30.81	31.17	31.53	31.89	32.24	32.60	32.96	33.32	33.67	34.03	34.39	34.75	35.10	35.46
72	Th	43.10	43.54	43.97	44.41	44.85	45.29	45.73	46.17	46.60	47.04	47.48	47.92	48.36	48.79	49.23
	Ca	30.07	30.42	30.78	31.14	31.50	31.85	32.21	32.57	32.93	33.28	33.64	34.00	34.36	34.71	35.07
70	Th	42.14	42.58	43.02	43.46	43.90	44.33	44.77	45.21	45.65	46.09	46.52	46.96	47.40	47.84	48.28
	Ca	29.68	30.03	30.39	30.75	31.11	31.46	31.82	32.18	32.54	32.89	33.25	33.61	33.97	34.32	34.68
68	Th	41.19	41.63	42.07	42.50	42.94	43.38	43.82	44.26	44.69	45.13	45.57	46.01	46.44	46.88	47.32
	Ca	29.29	29.64	30.00	30.36	30.72	31.07	31.43	31.79	32.15	32.50	32.86	33.22	33.58	33.93	34.29
66	Th	40.23	40.67	41.11	41.55	41.99	42.42	42.86	43.30	43.74	44.18	44.62	45.05	45.49	45.92	46.37
	Ca	28.90	29.25	29.61	29.97	30.33	30.68	31.04	31.40	31.76	32.11	32.47	32.82	33.19	33.54	33.90

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.219	0	.179
.1	.048	.267	.020	.198
.2	.095	.315	.039	.218
.3	.143	.362	.059	.237
.4	.191	.410	.078	.257
.5	.239	.458	.098	.276
.6	.286	.505	.117	.296
.7	.334	.553	.137	.315
.8	.382	.601	.156	.335
.9	.430	.649	.176	.354
1.0	.477	.696	.195	.374
1.1	.525	.744	.215	.393
1.2	.573	.792	.234	.413
1.3	.621	.840	.254	.432
1.4	.668	.887	.273	.452
1.5	.716	.935	.293	.471
1.6	.764	.983	.312	.491
1.7	.812	1.031	.332	.510
1.8	.859	1.078	.351	.530
1.9	.907	1.126	.371	.549

Table 108

Norms for Upper Arm and Forearm of Seventeen-Year-Old Boys (Upper arm = .2424 chest circumference + 1.7731 elbow - 6.2395; forearm = .1631 chest circumference + 1.8009 elbow - .1394)

Chest Circumference, Centimeters		Elbow Width, Centimeters																						
		5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9
100	UA	28.11	28.28	28.46	28.64	28.82	28.99	29.17	29.35	29.53	29.70	29.88	30.06	30.23	30.41	30.59	30.77	30.94	31.12	31.30	31.48	31.65	31.83	32.01
	FA	26.44	26.62	26.80	26.98	27.16	27.34	27.52	27.70	27.88	28.06	28.24	28.42	28.60	28.78	28.96	29.14	29.32	29.50	29.68	29.86	30.04	30.22	30.40
98	UA	27.62	27.80	27.98	28.15	28.33	28.51	28.69	28.86	29.04	29.22	29.40	29.57	29.75	29.93	30.10	30.28	30.46	30.64	30.81	30.99	31.17	31.35	31.52
	FA	26.11	26.29	26.47	26.65	26.83	27.01	27.19	27.37	27.55	27.73	27.91	28.09	28.27	28.45	28.63	28.81	28.99	29.17	29.35	29.53	29.71	29.89	30.07
96	UA	27.14	27.31	27.49	27.67	27.85	28.02	28.20	28.38	28.56	28.73	28.91	29.09	29.27	29.44	29.62	29.80	29.97	30.15	30.33	30.51	30.68	30.86	31.04
	FA	25.78	25.96	26.14	26.32	26.50	26.68	26.86	27.04	27.22	27.40	27.58	27.76	27.94	28.12	28.30	28.48	28.66	28.84	29.02	29.21	29.39	29.57	29.75
94	UA	26.65	26.83	27.01	27.18	27.36	27.54	27.72	27.89	28.07	28.25	28.43	28.60	28.78	28.96	29.14	29.31	29.49	29.67	29.84	30.02	30.20	30.38	30.55
	FA	25.46	25.64	25.82	26.00	26.18	26.36	26.54	26.72	26.90	27.08	27.26	27.44	27.62	27.80	27.98	28.16	28.34	28.52	28.70	28.88	29.06	29.24	29.42
92	UA	26.17	26.35	26.52	26.70	26.88	27.05	27.23	27.41	27.59	27.76	27.94	28.12	28.30	28.47	28.65	28.83	29.00	29.18	29.36	29.54	29.71	29.89	30.07
	FA	25.13	25.31	25.49	25.67	25.85	26.03	26.21	26.39	26.57	26.75	26.93	27.11	27.29	27.47	27.65	27.83	28.01	28.19	28.37	28.55	28.73	28.91	29.09
90	UA	25.68	25.86	26.04	26.22	26.39	26.57	26.75	26.92	27.10	27.28	27.46	27.63	27.81	27.99	28.17	28.34	28.52	28.70	28.87	29.05	29.23	29.41	29.58
	FA	24.80	24.98	25.16	25.35	25.53	25.71	25.89	26.07	26.25	26.43	26.61	26.79	26.97	27.15	27.33	27.51	27.69	27.87	28.05	28.23	28.41	28.59	28.77
88	UA	25.20	25.38	25.55	25.73	25.91	26.08	26.26	26.44	26.62	26.79	26.97	27.15	27.33	27.51	27.68	27.86	28.04	28.21	28.39	28.57	28.74	28.92	29.10
	FA	24.48	24.66	24.84	25.02	25.20	25.38	25.56	25.74	25.92	26.10	26.28	26.46	26.64	26.82	27.00	27.18	27.36	27.54	27.72	27.90	28.08	28.26	28.44
86	UA	24.71	24.89	25.07	25.25	25.42	25.60	25.78	25.95	26.13	26.31	26.49	26.66	26.84	27.02	27.20	27.37	27.55	27.73	27.91	28.08	28.26	28.44	28.61
	FA	24.15	24.33	24.51	24.69	24.87	25.05	25.23	25.41	25.59	25.77	25.95	26.13	26.31	26.49	26.67	26.85	27.03	27.21	27.39	27.57	27.75	27.93	28.11
84	UA	24.23	24.41	24.58	24.76	24.94	25.12	25.29	25.47	25.65	25.82	26.00	26.18	26.36	26.53	26.71	26.89	27.07	27.24	27.42	27.60	27.77	27.95	28.13
	FA	23.83	24.01	24.19	24.37	24.55	24.73	24.91	25.09	25.27	25.45	25.63	25.81	25.99	26.17	26.35	26.53	26.71	26.89	27.07	27.25	27.43	27.61	27.79
82	UA	23.74	23.92	24.10	24.28	24.45	24.63	24.81	24.99	25.16	25.34	25.52	25.69	25.87	26.05	26.23	26.40	26.58	26.76	26.94	27.11	27.29	27.47	27.64
	FA	23.50	23.68	23.86	24.04	24.22	24.40	24.58	24.76	24.94	25.12	25.30	25.48	25.66	25.84	26.02	26.20	26.38	26.56	26.74	26.92	27.10	27.28	27.46
80	UA	23.26	23.44	23.61	23.79	23.97	24.15	24.32	24.50	24.68	24.85	25.03	25.21	25.39	25.56	25.74	25.92	26.10	26.27	26.45	26.63	26.81	26.98	27.16
	FA	23.17	23.35	23.53	23.71	23.89	24.07	24.25	24.43	24.61	24.79	24.97	25.15	25.33	25.51	25.69	25.88	26.06	26.24	26.42	26.60	26.78	26.96	27.14
78	UA	22.77	22.95	23.13	23.31	23.48	23.66	23.84	24.02	24.19	24.37	24.55	24.72	24.90	25.08	25.26	25.43	25.61	25.79	25.97	26.14	26.32	26.50	26.68
	FA	22.85	23.03	23.21	23.39	23.57	23.75	23.93	24.11	24.29	24.47	24.65	24.83	25.01	25.19	25.37	25.55	25.73	25.91	26.09	26.27	26.45	26.63	26.81
76	UA	22.29	22.47	22.64	22.82	23.00	23.18	23.35	23.53	23.71	23.89	24.06	24.24	24.42	24.59	24.77	24.95	25.13	25.31	25.48	25.66	25.84	26.01	26.19
	FA	22.52	22.70	22.88	23.06	23.24	23.42	23.60	23.78	23.96	24.14	24.32	24.50	24.68	24.86	25.04	25.22	25.40	25.58	25.76	25.94	26.12	26.30	26.48
74	UA	21.80	21.98	22.16	22.34	22.51	22.69	22.87	23.05	23.22	23.40	23.58	23.76	23.93	24.11	24.29	24.46	24.64	24.82	25.00	25.17	25.35	25.52	25.71
	FA	22.20	22.38	22.56	22.74	22.92	23.10	23.28	23.46	23.64	23.82	24.00	24.18	24.36	24.54	24.72	24.90	25.08	25.26	25.44	25.62	25.80	25.98	26.16
72	UA	21.32	21.50	21.67	21.85	22.03	22.21	22.38	22.56	22.74	22.92	23.09	23.27	23.45	23.63	23.80	23.98	24.16	24.33	24.51	24.69	24.87	25.04	25.22
	FA	21.87	22.05	22.23	22.41	22.59	22.77	22.95	23.13	23.31	23.49	23.67	23.85	24.03	24.21	24.39	24.57	24.75	24.93	25.11	25.29	25.47	25.65	25.83
70	UA	20.84	21.01	21.19	21.37	21.54	21.72	21.90	22.08	22.25	22.43	22.61	22.79	22.96	23.14	23.32	23.49	23.67	23.85	24.03	24.20	24.38	24.56	24.74
	FA	21.54	21.72	21.90	22.08	22.26	22.44	22.62	22.80	22.98	23.16	23.34	23.52	23.70	23.88	24.06	24.24	24.42	24.60	24.78	24.96	25.14	25.32	25.50
68	UA	20.35	20.53	20.70	20.88	21.06	21.24	21.41	21.59	21.77	21.95	22.12	22.30	22.48	22.66	22.83	23.01	23.19	23.36	23.54	23.72	23.90	24.07	24.25
	FA	21.22	21.40	21.58	21.76	21.94	22.12	22.30	22.48	22.66	22.84	23.02	23.20	23.38	23.56	23.74	23.92	24.10	24.28	24.46	24.64	24.82	25.00	25.18
66	UA	19.87	20.04	20.22	20.40	20.57	20.75	20.93	21.11	21.28	21.46	21.64	21.82	21.99	22.17	22.35	22.53	22.71	22.88	23.06	23.23	23.41	23.59	23.77
	FA	20.89	21.07	21.25	21.43	21.61	21.79	21.97	22.15	22.33	22.51	22.69	22.87	23.05	23.23	23.41	23.59	23.77	23.95	24.13	24.31	24.49	24.67	24.85

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.024	.016
.2	.048	.033
.3	.073	.049
.4	.097	.065
.5	.121	.082
.6	.145	.098
.7	.170	.114
.8	.194	.130
.9	.218	.147
1.0	.242	.163
1.1	.267	.179
1.2	.291	.196
1.3	.315	.212
1.4	.339	.228
1.5	.364	.245
1.6	.388	.261
1.7	.412	.277
1.8	.436	.294
1.9	.461	.310

Table 109

Norms for Thigh and Calf of Seventeen-Year-Old Boys (Thigh = .4062 chest circumference + 2.7402 knee - 8.0852; calf = .1379 chest circumference + 2.3222 knee + 1.3970)

Chest Circumference, Centimeters		Knee Width, Centimeters															
		8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2
100	Th	55.00	55.55	56.10	56.65	57.20	57.74	58.29	58.84	59.39	59.94	60.48	61.03	61.58	62.13	62.68	63.23
	Ca	34.23	34.69	35.16	35.62	36.09	36.55	37.02	37.48	37.94	38.41	38.87	39.34	39.80	40.27	40.73	41.20
98	Th	54.19	54.74	55.29	55.84	56.38	56.93	57.48	58.03	58.58	59.12	59.67	60.22	60.77	61.32	61.86	62.41
	Ca	33.95	34.42	34.88	35.35	35.81	36.78	36.74	37.20	37.67	38.13	38.60	39.06	39.53	39.99	40.46	40.92
96	Th	53.38	53.93	54.48	55.02	55.57	54.12	56.67	57.22	57.76	58.31	58.86	59.41	59.95	60.50	61.05	61.60
	Ca	33.68	34.14	34.61	35.07	35.54	36.00	36.46	36.93	37.39	37.86	38.32	38.79	39.25	39.72	40.18	40.64
94	Th	52.57	53.12	53.66	54.21	54.76	55.31	55.86	56.40	56.95	57.50	58.05	58.60	59.14	59.69	60.24	60.79
	Ca	33.40	33.87	34.33	34.79	35.26	35.72	36.19	36.65	37.12	37.58	38.05	38.51	38.97	39.44	39.90	40.37
92	Th	51.75	52.30	52.85	53.40	53.95	54.50	55.04	55.59	56.14	56.69	57.24	57.78	58.33	58.88	59.43	59.98
	Ca	33.13	33.59	34.05	34.52	34.98	35.45	35.91	36.38	36.84	37.31	37.77	38.23	38.70	39.16	39.63	40.09
90	Th	50.94	51.49	52.04	52.59	53.13	53.68	54.23	54.78	55.33	55.87	56.42	56.97	57.52	58.07	58.62	59.16
	Ca	32.85	33.31	33.78	34.24	34.71	35.17	35.64	36.10	36.57	37.03	37.49	37.96	38.42	38.89	39.35	39.82
88	Th	50.13	50.68	51.23	51.77	52.32	52.87	53.42	53.97	54.51	55.06	55.61	56.16	56.71	57.25	57.80	58.35
	Ca	32.57	33.04	33.50	33.97	34.43	34.90	35.36	35.83	36.29	36.75	37.22	37.68	38.15	38.61	39.08	39.54
86	Th	49.32	49.87	50.41	50.96	51.51	52.06	52.61	53.15	53.70	54.25	54.80	55.35	55.89	56.44	56.99	57.54
	Ca	32.30	32.76	33.23	33.69	34.16	34.62	35.09	35.55	36.01	36.48	36.94	37.41	37.87	38.34	38.80	39.27
84	Th	48.51	49.05	49.60	50.15	50.70	51.25	51.79	52.34	52.89	53.44	53.99	54.53	55.08	55.63	56.18	56.73
	Ca	32.02	32.49	32.95	33.42	33.88	34.34	34.81	35.27	35.74	36.20	36.67	37.13	37.60	38.06	38.52	38.99
82	Th	47.69	48.24	48.79	49.34	49.89	50.43	50.98	51.53	52.08	52.63	53.17	53.72	54.27	54.82	55.37	55.91
	Ca	31.75	32.21	32.68	33.14	33.60	34.07	34.53	35.00	35.46	35.93	36.39	36.86	37.32	37.78	38.25	38.71
80	Th	46.88	47.43	47.98	48.52	49.07	49.62	50.17	50.72	51.26	51.81	52.36	52.91	53.46	54.00	54.55	55.10
	Ca	31.47	31.94	32.40	32.86	33.33	33.79	34.26	34.72	35.19	35.65	36.12	36.58	37.04	37.51	37.97	38.44
78	Th	46.07	46.62	47.16	47.71	48.26	48.81	49.36	49.90	50.45	51.00	51.55	52.10	52.64	53.19	53.74	54.29
	Ca	31.20	31.66	32.12	32.59	33.05	33.52	33.98	34.45	34.91	35.38	35.84	36.30	36.77	37.23	37.70	38.16
76	Th	45.26	45.80	46.35	46.90	47.45	48.00	48.55	49.09	49.64	50.19	50.74	51.28	51.83	52.38	52.93	53.48
	Ca	30.92	31.38	31.85	32.31	32.78	33.24	33.71	34.17	34.62	35.10	35.56	36.03	36.49	36.96	37.42	37.89
74	Th	44.44	44.99	45.54	46.09	46.64	47.18	47.73	48.28	48.83	49.38	49.92	50.47	51.02	51.57	52.12	52.66
	Ca	30.64	31.11	31.57	32.04	32.50	32.97	33.43	33.89	34.36	34.82	35.29	35.75	36.22	36.68	37.15	37.61
72	Th	43.63	44.18	44.73	45.27	45.82	46.37	46.92	47.47	48.02	48.56	49.11	49.66	50.21	50.76	51.30	51.85
	Ca	30.37	30.83	31.30	31.76	32.23	32.69	33.15	33.62	34.08	34.55	35.02	35.48	35.94	36.41	36.87	37.33
70	Th	42.82	43.37	43.91	44.46	45.01	45.56	46.11	46.65	47.20	47.75	48.30	48.85	49.39	49.94	50.49	51.04
	Ca	30.09	30.56	31.02	31.49	31.95	32.41	32.88	33.34	33.81	34.27	34.74	35.20	35.67	36.13	36.59	37.06
68	Th	42.01	42.55	43.10	43.65	44.20	44.75	45.29	45.84	46.39	46.94	47.49	48.03	48.58	49.13	49.68	50.23
	Ca	29.82	30.28	30.75	31.21	31.67	32.14	32.60	33.07	33.53	34.00	34.46	34.93	35.39	35.85	36.32	36.79
66	Th	41.19	41.74	42.29	42.84	43.39	43.93	44.48	45.03	45.58	46.13	46.67	47.22	47.77	48.32	48.87	49.41
	Ca	29.54	30.00	30.47	30.93	31.40	31.86	32.33	32.79	33.26	33.72	34.18	34.65	35.11	35.58	36.04	36.51

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.274	0	.232
.1	.041	.315	.014	.246
.2	.081	.355	.028	.260
.3	.122	.396	.041	.274
.4	.162	.437	.055	.287
.5	.203	.477	.069	.301
.6	.244	.518	.083	.315
.7	.284	.558	.097	.329
.8	.325	.599	.110	.343
.9	.366	.640	.124	.356
1.0	.406	.680	.138	.370
1.1	.447	.721	.152	.384
1.2	.487	.761	.165	.398
1.3	.528	.802	.179	.411
1.4	.569	.843	.193	.425
1.5	.609	.883	.207	.439
1.6	.650	.924	.221	.453
1.7	.691	.965	.234	.467
1.8	.731	1.005	.248	.480
1.9	.772	1.046	.262	.494

Table 110

Norms for Upper Arm, Forearm, Thigh, and Calf for College Men (Upper arm = .2994 chest circumference + .4217 knee - 2.6902; forearm = .1933 chest circumference + .4001 knee + 5.5325; thigh = .5641 chest circumference + 1.1272 knee - 5.5759; calf = .2356 chest circumference + .7602 knee + 8.1367)

Chest Circumference, Centimeters	Measurement	Knee 8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8	12.0
105	Upper arm	32.20	32.28	32.37	32.45	32.54	32.62	32.71	32.79	32.87	32.96	33.04	33.13	33.21	33.30	33.38	33.46	33.55	33.63	33.72	33.80
	Forearm	29.11	29.19	29.27	29.35	29.43	29.51	29.59	29.67	29.75	29.83	29.91	29.99	30.07	30.15	30.23	30.31	30.39	30.47	30.55	30.63
	Thigh	62.90	63.12	63.35	63.57	63.80	64.02	64.25	64.48	64.70	64.93	65.15	65.38	65.60	65.83	66.05	66.28	66.50	66.73	66.96	67.18
	Calf	39.11	39.26	39.41	39.56	39.72	39.87	40.02	40.17	40.32	40.48	40.63	40.78	40.93	41.08	41.24	41.39	41.54	41.69	41.85	42.00
104	Upper arm	31.90	31.99	32.07	32.15	32.24	32.32	32.41	32.49	32.58	32.66	32.74	32.83	32.91	33.00	33.08	33.16	33.25	33.33	33.42	33.50
	Forearm	28.92	29.00	29.08	29.16	29.24	29.32	29.40	29.48	29.56	29.64	29.72	29.80	29.88	29.96	30.04	30.12	30.20	30.28	30.36	30.44
	Thigh	62.33	62.56	62.78	63.01	63.24	63.46	63.69	63.91	64.14	64.36	64.59	64.81	65.04	65.26	65.49	65.72	65.94	66.17	66.39	66.62
	Calf	38.87	39.02	39.18	39.33	39.48	39.63	39.78	39.94	40.09	40.24	40.39	40.55	40.70	40.85	41.00	41.15	41.31	41.46	41.61	41.76
103	Upper arm	31.60	31.69	31.77	31.85	31.94	32.02	32.11	32.19	32.28	32.36	32.44	32.53	32.61	32.70	32.78	32.87	32.95	33.03	33.12	33.20
	Forearm	28.72	28.80	28.88	28.96	29.04	29.12	29.20	29.28	29.36	29.44	29.52	29.60	29.68	29.76	29.84	29.92	30.00	30.08	30.16	30.24
	Thigh	61.77	61.99	62.22	62.45	62.67	62.90	63.12	63.35	63.57	63.80	64.02	64.25	64.47	64.70	64.93	65.15	65.38	65.60	65.83	66.05
	Calf	38.64	38.79	38.94	39.09	39.25	39.40	39.55	39.70	39.85	40.01	40.16	40.31	40.46	40.61	40.77	40.92	41.07	41.22	41.37	41.53
102	Upper arm	31.30	31.39	31.47	31.56	31.64	31.72	31.81	31.89	31.98	32.06	32.14	32.23	32.31	32.40	32.48	32.57	32.65	32.73	32.82	32.90
	Forearm	28.53	28.61	28.69	28.77	28.85	28.93	29.01	29.09	29.17	29.25	29.33	29.41	29.49	29.57	29.65	29.73	29.81	29.89	29.97	30.05
	Thigh	61.21	61.43	61.66	61.88	62.11	62.33	62.56	62.78	63.01	63.23	63.46	63.69	63.91	64.14	64.36	64.59	64.81	65.04	65.26	65.49
	Calf	38.40	38.55	38.71	38.86	39.01	39.16	39.31	39.47	39.62	39.77	39.92	40.07	40.23	40.38	40.53	40.68	40.83	40.99	41.14	41.29
101	Upper arm	31.00	31.09	31.17	31.26	31.34	31.42	31.51	31.59	31.68	31.76	31.85	31.93	32.01	32.10	32.18	32.27	32.35	32.44	32.52	32.60
	Forearm	28.34	28.42	28.50	28.58	28.66	28.74	28.82	28.90	28.98	29.06	29.14	29.22	29.30	29.38	29.46	29.54	29.62	29.70	29.78	29.86
	Thigh	60.64	60.87	61.09	61.32	61.54	61.77	61.99	62.22	62.44	62.67	62.90	63.12	63.35	63.57	63.80	64.02	64.25	64.47	64.70	64.92
	Calf	38.17	38.32	38.47	38.62	38.77	38.93	39.08	39.23	39.38	39.53	39.69	39.84	39.99	40.14	40.29	40.45	40.60	40.75	40.90	41.05
100	Upper arm	30.70	30.79	30.87	30.96	31.04	31.12	31.21	31.29	31.38	31.46	31.55	31.63	31.71	31.80	31.88	31.97	32.05	32.14	32.22	32.30
	Forearm	28.14	28.22	28.30	28.38	28.46	28.54	28.62	28.70	28.78	28.86	28.94	29.02	29.10	29.18	29.26	29.34	29.43	29.50	29.58	29.66
	Thigh	60.08	60.30	60.53	60.75	60.98	61.20	61.43	61.66	61.88	62.11	62.33	62.56	62.78	63.01	63.23	63.46	63.68	63.91	64.14	64.36
	Calf	37.93	38.08	38.23	38.39	38.54	38.69	38.84	38.99	39.15	39.30	39.45	39.60	39.75	39.91	40.06	40.21	40.36	40.52	40.67	40.82
99	Upper arm	30.40	30.49	30.57	30.66	30.74	30.83	30.91	30.99	31.08	31.16	31.25	31.33	31.42	31.50	31.58	31.67	31.75	31.84	31.92	32.00
	Forearm	27.95	28.03	28.11	28.19	28.27	28.35	28.43	28.51	28.59	28.67	28.75	28.83	28.91	28.99	29.07	29.15	29.23	29.31	29.39	29.47
	Thigh	59.51	59.74	59.96	60.19	60.41	60.64	60.87	61.09	61.32	61.54	61.77	61.99	62.22	62.44	62.67	62.89	63.12	63.35	63.57	63.80
	Calf	37.69	37.85	38.00	38.15	38.30	38.45	38.61	38.76	38.91	39.06	39.22	39.37	39.52	39.67	39.82	39.98	40.13	40.28	40.43	40.58
98	Upper arm	30.10	30.19	30.27	30.36	30.44	30.53	30.61	30.69	30.78	30.86	30.95	31.03	31.12	31.20	31.28	31.37	31.45	31.54	31.62	31.71
	Forearm	27.76	27.84	27.92	28.00	28.08	28.16	28.24	28.32	28.40	28.48	28.56	28.64	28.72	28.80	28.88	28.96	29.04	29.12	29.20	29.28
	Thigh	58.95	59.17	59.40	59.63	59.85	60.08	60.30	60.53	60.75	60.98	61.20	61.43	61.65	61.88	62.11	62.33	62.56	62.78	63.01	63.23
	Calf	37.46	37.61	37.76	37.92	38.07	38.22	38.37	38.52	38.68	38.83	38.98	39.13	39.28	39.44	39.59	39.74	39.89	40.04	40.20	40.35
97	Upper arm	29.81	29.89	29.97	30.06	30.14	30.23	30.31	30.40	30.48	30.56	30.65	30.73	30.82	30.90	30.98	31.07	31.15	31.24	31.32	31.41
	Forearm	27.56	27.64	27.72	27.80	27.88	27.96	28.04	28.12	28.20	28.28	28.36	28.44	28.52	28.60	28.68	28.76	28.84	28.92	29.00	29.08
	Thigh	58.38	58.61	58.84	59.06	59.29	59.51	59.74	59.96	60.19	60.41	60.64	60.86	61.09	61.32	61.54	61.77	61.99	62.22	62.44	62.67
	Calf	37.22	37.38	37.53	37.68	37.83	37.98	38.14	38.29	38.44	38.59	38.74	38.90	39.05	39.20	39.35	39.50	39.66	39.81	39.96	40.11
96	Upper arm	29.51	29.59	29.67	29.76	29.84	29.93	30.01	30.10	30.18	30.26	30.35	30.43	30.52	30.60	30.69	30.78	30.85	30.94	31.02	31.11
	Forearm	27.37	27.45	27.53	27.61	27.69	27.77	27.85	27.93	28.01	28.09	28.17	28.25	28.33	28.41	28.49	28.57	28.65	28.73	28.81	28.89
	Thigh	57.82	58.05	58.27	58.50	58.72	58.95	59.17	59.40	59.62	59.85	60.08	60.30	60.53	60.75	60.98	61.20	61.43	61.65	61.88	62.10
	Calf	36.99	37.14	37.29	37.44	37.60	37.75	37.90	38.05	38.20	38.36	38.51	38.66	38.81	38.96	39.12	39.27	39.42	39.57	39.72	39.88
95	Upper arm	29.21	29.29	29.38	29.46	29.54	29.63	29.71	29.80	29.88	29.96	30.05	30.13	30.22	30.30	30.39	30.47	30.55	30.64	30.72	30.81
	Forearm	27.18	27.26	27.34	27.42	27.50	27.58	27.66	27.74	27.82	27.90	27.98	28.06	28.14	28.22	28.30	28.38	28.46	28.54	28.62	28.70
	Thigh	57.26	57.48	57.71	57.93	58.16	58.38	58.61	58.83	59.06	59.29	59.51	59.74	59.96	60.19	60.41	60.64	60.86	61.09	61.31	61.54
	Calf	36.75	36.90	37.06	37.21	37.36	37.51	37.66	37.82	37.97	38.12	38.27	38.42	38.58	38.73	38.88	39.03	39.18	39.34	39.49	39.64
94	Upper arm	28.91	28.99	29.08	29.16	29.24	29.33	29.41	29.50	29.58	29.66	29.75	29.83	29.92	30.00	30.09	30.17	30.26	30.34	30.42	30.51
	Forearm	26.98	27.06	27.14	27.22	27.30	27.38	27.46	27.54	27.62	27.70	27.78	27.86	27.94	28.02	28.10	28.18	28.26	28.34	28.42	28.50
	Thigh	56.69	56.92	57.14	57.37	57.59	57.82	58.05	58.27	58.50	58.72	58.95	59.17	59.40	59.62	59.85	60.07	60.30	60.53	60.75	60.98
	Calf	36.52	36.67	36.82	36.97	37.12	37.28	37.43	37.58	37.73	37.89	38.04	38.19	38.34	38.49	38.65	38.80	38.95	39.10	39.25	39.41
93	Upper arm	28.61	28.69	28.78	28.86	28.94	29.03	29.11	29.20	29.28	29.37	29.45	29.53	29.62	29.70	29.79	29.87	29.96	30.04	30.12	30.21
	Forearm	26.79	26.87	26.95	27.03	27.11	27.19	27.27	27.35	27.43	27.51	27.59	27.67	27.75	27.83	27.91	27.99	28.07	28.15	28.23	28.31
	Thigh	56.13	56.35	56.58	56.80	57.03	57.26	57.48	57.71	57.93	58.16	58.38	58.61	58.83	59.06	59.28	59.51	59.74	59.96	60.19	60.41
	Calf	36.28	36.43	36.59	36.74	36.89	37.04	37.19	37.35	37.50	37.65	37.80	37.95	38.11	38.26	38.41	38.56	38.71	38.87	39.02	39.17
92	Upper arm	28.31	28.39	28.48	28.56	28.65	28.73	28.81	28.90	28.98	29.07	29.15	29.24	29.32	29.40	29.49	29.57	29.66	29.74	29.82	29.91
	Forearm	26.60	26.68	26.76	26.84	26.92	27.00	27.08	27.16	27.24	27.32	27.40	27.48	27.56	27.64	27.72	27.80	27.88	27.96	28.04	28.12
	Thigh	55.56	55.79	56.02	56.24	56.47	56.69	56.92	57.14	57.37	57.59	57.82	58.04	58.27	58.50	58.72	58.95	59.17	59.40	59.62	59.85
	Calf	36.05	36.20	36.35	36.50	36.65	36.81	36.96	37.11	37.26	37.41	37.57	37.72	37.87	38.02	38.17	38.33	38.48	38.63	38.78	38.93
91	Upper arm	28.01	28.09	28.18	28.26	28.35	28.43	28.51	28.60	28.68	28.77	28.85	28.94	29.02	29.10	29.19	29.27	29.36	29.44	29.53	29.61
	Forearm	26.40	26.48	26.56	26.64	26.72	26.80	26.88	26.96	27.04	27.12	27.20	27.28	27.36	27.44	27.52	27.60	27.68	27.76	27.84	27.92
	Thigh	55.00	55.23	55.45	55.68	55.90	56.13	56.35	56.58	56.80	57.03	57.25	57.48	57.71	57.93	58.16	58.38	58.61	58.83	59.06	59.28
	Calf	35.81	35.96	36.11	36.27	36.42	36.57	36.72	36.87	37.03	37.18	37.33	37.48	37.63	37.79	37.94	38.09	38.24	38.39	38.55	38.70
90	Upper arm	27.71	27.79	27.88	27.96	28.05	28.13	28.22	28.30	28.38	28.47	28.55	28.64	28.72	28.80	28.89	28.97	29.06	29.14	29.23	29.31
	Forearm	26.21	26.29	26.37	26.45	26.53	26.61	26.69	26.77	26.85	26.93	27.01	27.09	27.17	27.25	27.33	27.41	27.49	27.57	27.65	27.73
	Thigh	54.44	54.66	54.89	55.11	55.34	55.56	55.79	56.01	56.24	56.47	56.69	56.92	57.14	57.37	57.59	57.82	58.04	58.27	58.49	58.72
	Calf	35.57	35.73	35.88	36.03	36.18	36.33	36.49	36.64	36.79	36.94	37.09	37.25	37.40	37.55	37.70	37.85	38.01	38.16	38.31	38.46
89	Upper arm	27.41	27.49	27.58	27.66	27.75	27.83	27.92	28.00	28.08	28.17	28.25	28.34	28.42	28.51	28.59	28.67	28.76	28.84	28.93	29.01
	Forearm	26.02	26.10	26.18	26.26	26.34	26.42	26.50	26.58	26.66	26.74	26.82	26.90	26.98	27.06	27.14	27.22	27.30	27.38	27.46	27.54
	Thigh	53.87	54.10	54.32	54.55	54.77	55.00	55.22	55.45	55.68	55.90	56.13	56.35	56.58	56.80	57.03	57.25	57.48	57.70	57.93	58.16
	Calf	35.34	35.49	35.64	35.79	35.95	36.10	36.25	36.40	36.56	36.71	36.86	37.01	37.16	37.32	37.47	37.62	37.77	37.92	38.08	38.23
88	Upper arm	27.11	27.20	27.28	27.36	27.45	27.53	27.62	27.70	27.78	27.87	27.95	28.04	28.12	28.21	28.29	28.37	28.46	28.54	28.63	28.71
	Forearm	25.82	25.90	25.98	26.06	26.14	26.22	26.30	26.38	26.46	26.54	26.62	26.70	26.78	26.86	26.94	27.02	27.10	27.18	27.26	27.34
	Thigh	53.31	53.53	53.76	53.98	54.21	54.44	54.66	54.89	55.11	55.34	55.56	55.79	56.01	56.24	56.46	56.69	56.91	57.14	57.37	57.59
	Calf	35.10	35.26	35.41	35.56	35.71	35.86	36.02	36.17	36.32	36.47	36.62	36.78	36.93	37.08	37.23	37.38	37.54	37.69	37.84	37.99
87	Upper arm	26.81	26.90	26.98	27.06	27.15	27.23	27.32	27.40	27.49	27.57	27.65	27.74	27.82	27.91	27.99	28.08	28.16	28.24	28.33	28.41
	Forearm	25.63	25.71	25.79	25.87	25.95	26.03	26.11	26.19	26.27	26.35	26.43	26.51	26.59	26.67	26.75	26.83	26.91	26.99	27.07	27.15
	Thigh	52.74	52.97	53.19	53.42	53.65	53.87	54.10	54.32	54.55	54.77	55.00	55.22	55.45	55.68	55.90	56.13	56.35	56.58	56.80	57.03
	Calf	34.87	35.02	35.17	35.32	35.48	35.63	35.78	35.93	36.08	36.24	36.39	36.54	36.69	36.84	37.00	37.15	37.30	37.45	37.60	37.76
86	Upper arm	26.51	26.60	26.68	26.76	26.85	26.93	27.02	27.10	27.19	27.27	27.35	27.44	27.52	27.61	27.69	27.78	27.86	27.94	28.03	28.11
	Forearm	25.44	25.52	25.60	25.68	25.76	25.84	25.92	26.00	26.08	26.16	26.24	26.32	26.40	26.48	26.56	26.64	26.72	26.80	26.88	26.96
	Thigh	52.18	52.41	52.63	52.87	53.08	53.31	53.53	53.76	53.98	54.21	54.43	54.66	54.89	55.11	55.34	55.56	55.79	56.01	56.24	56.46
	Calf	34.63	34.78	34.94	35.09	35.24	35.39	35.54	35.70	35.85	36.00	36.15	36.30	36.46	36.61	36.76	36.91	37.06	37.22	37.37	37.52
85	Upper arm	26.21	26.30	26.38	26.47	26.55	26.63	26.72	26.80	26.89	26.97	27.06	27.14	27.22	27.31	27.39	27.48	27.56	27.64	27.73	27.81
	Forearm	25.24	25.32	25.40	25.48	25.56	25.63	25.72	25.80	25.88	25.96	26.04	26.12	26.20	26.28	26.36	26.44	26.52	26.60	26.68	26.76
	Thigh	51.62	51.84	52.07	52.29	52.52	52.74	52.97	53.19	53.42	53.64	53.87	54.10	54.32	54.55	54.77	55.00	55.22	55.45	55.67	55.90
	Calf	34.40	34.55	34.70	34.85	35.00	35.16	35.31	35.46	35.61	35.76	35.92	36.07	36.22	36.37	36.52	36.68	36.83	36.98	37.13	37.29
84	Upper arm	25.91	26.00	26.08	26.19	26.25	26.33	26.42	26.50	26.59	26.67	26.76	26.84	26.92	27.01	27.09	27.18	27.26	27.35	27.43	27.51
	Forearm	25.05	25.13	25.21	25.29	25.37	25.45	25.53	25.61	25.69	25.77	25.85	25.93	26.01	26.09	26.17	26.25	26.33	26.41	26.49	26.57
	Thigh	51.05	51.28	51.50	51.73	51.95	52.18	52.40	52.63	52.86	53.08	53.31	53.53	53.76	53.98	54.21	54.43	54.66	54.88	55.11	55.33
	Calf	34.16	34.31	34.46	34.62	34.77	34.92	35.07	35.23	35.38	35.53	35.68	35.83	35.99	36.14	36.29	36.44	36.59	36.75	36.90	37.05
83	Upper arm	25.61	25.70	25.78	25.87	25.95	26.04	26.12	26.20	26.29	26.37	26.46	26.54	26.62	26.71	26.79	26.88	26.96	27.05	27.13	27.21
	Forearm	24.86	24.94	25.02	25.10	25.18	25.26	25.34	25.42	25.50	25.58	25.66	25.74	25.82	25.90	25.98	26.06	26.14	26.22	26.30	26.38
	Thigh	50.49	50.71	50.94	51.16	51.39	51.61	51.84	52.07	52.29	52.52	52.74	52.97	53.19	53.42	53.64	53.87	54.09	54.32	54.55	54.77
	Calf	33.93	34.08	34.23	34.38	34.53	34.69	34.84	34.99	35.14	35.29	35.45	35.60	35.75	35.90	36.05	36.21	36.36	36.51	36.66	36.81
82	Upper arm	25.31	25.40	25.48	25.57	25.65	25.74	25.82	25.90	25.99	26.07	26.16	26.24	26.34	26.41	26.49	26.58	26.66	26.75	26.83	26.92
	Forearm	24.66	24.74	24.82	24.90	24.98	25.06	25.14	25.22	25.30	25.38	25.46	25.54	25.62	25.70	25.78	25.86	25.94	26.02	26.10	26.18
	Thigh	49.92	50.15	50.37	50.60	50.83	51.05	51.28	51.50	51.73	51.95	52.18	52.40	52.63	52.85	53.08	53.30	53.53	53.76	53.98	54.21
	Calf	33.69	33.84	33.99	34.15	34.30	34.45	34.60	34.75	34.91	35.06	35.21	35.36	35.51	35.67	35.82	35.97	36.12	36.27	36.43	36.58
81	Upper arm	25.02	25.10	25.18	25.27	25.35	25.44	25.52	25.60	25.69	25.77	25.86	25.94	26.03	26.11	26.19	26.28	26.36	26.45	26.53	26.62
	Forearm	24.47	24.55	24.63	24.71	24.79	24.87	24.95	25.03	25.11	25.19	25.27	25.35	25.43	25.51	25.59	25.67	25.75	25.83	25.91	25.99
	Thigh	49.36	49.58	49.81	50.04	50.26	50.49	50.71	50.94	51.16	51.39	51.61	51.84	52.06	52.29	52.52	52.74	52.97	53.19	53.42	53.64
	Calf	33.45	33.61	33.76	33.91	34.06	34.21	34.37	34.52	34.67	34.82	34.97	35.13	35.28	35.43	35.58	35.73	35.89	36.04	36.19	36.34
80	Upper arm	24.72	24.80	24.88	24.97	25.05	25.14	25.22	25.31	25.39	25.47	25.56	25.64	25.73	25.81	25.90	25.98	26.06	26.15	26.23	26.32
	Forearm	24.28	24.36	24.44	24.52	24.60	24.68	24.76	24.84	24.92	25.00	25.08	25.16	25.24	25.32	25.40	25.48	25.56	25.64	25.72	25.80
	Thigh	48.80	49.02	49.25	49.47	49.70	49.92	50.15	50.37	50.60	50.82	51.05	51.27	51.50	51.73	51.95	52.18	52.40	52.63	52.85	53.08
	Calf	33.22	33.37	33.52	33.67	33.83	33.98	34.13	34.28	34.43	34.59	34.74	34.89	35.04	35.19	35.35	35.50	35.65	35.80	35.96	36.11
79	Upper arm	24.42	24.50	24.58	24.67	24.75	24.84	24.92	25.01	25.09	25.17	25.26	25.34	25.43	25.51	25.60	25.68	25.76	25.85	25.93	26.02
	Forearm	24.08	24.16	24.24	24.32	24.40	24.48	24.56	24.64	24.72	24.80	24.88	24.96	25.04	25.12	25.20	25.28	25.36	25.44	25.52	25.60
	Thigh	48.23	48.46	48.68	48.91	49.13	49.36	49.58	49.81	50.03	50.26	50.49	50.71	50.94	51.16	51.39	51.61	51.84	52.06	52.29	52.51
	Calf	32.98	33.13	33.29	33.44	33.59	33.74	33.89	34.05	34.20	34.35	34.50	34.66	34.81	34.96	35.11	35.26	35.42	35.57	35.72	35.87
78	Upper arm	24.12	24.20	24.29	24.37	24.45	24.54	24.62	24.71	24.79	24.88	24.96	25.04	25.13	25.21	25.30	25.38	25.46	25.55	25.63	25.72
	Forearm	23.89	23.97	24.05	24.13	24.21	24.29	24.37	24.45	24.53	24.61	24.69	24.77	24.85	24.93	25.01	25.09	25.17	25.25	25.33	25.41
	Thigh	47.67	47.89	48.12	48.34	48.57	48.80	49.02	49.25	49.47	49.70	49.92	50.15	50.37	50.60	50.82	51.05	51.27	51.50	51.72	51.95
	Calf	32.75	32.90	33.05	33.20	33.35	33.51	33.66	33.81	33.96	34.12	34.27	34.42	34.57	34.72	34.88	35.03	35.18	35.33	35.48	35.64
77	Upper arm	23.82	23.90	23.99	24.07	24.15	24.24	24.32	24.41	24.49	24.58	24.66	24.74	24.83	24.91	25.00	25.08	25.17	25.25	25.33	25.42
	Forearm	23.70	23.78	23.86	23.94	24.02	24.10	24.18	24.26	24.34	24.42	24.50	24.58	24.66	24.74	24.82	24.90	24.98	25.06	25.14	25.22
	Thigh	47.10	47.33	47.55	47.78	48.00	48.23	48.46	48.68	48.91	49.13	49.36	49.58	49.81	50.03	50.26	50.48	50.71	50.94	51.16	51.39
	Calf	32.51	32.66	32.82	32.97	33.12	33.27	33.42	33.58	33.73	33.88	34.03	34.18	34.34	34.49	34.64	34.79	34.94	35.10	35.25	35.40
76	Upper arm	23.52	23.60	23.69	23.77	23.86	23.94	24.02	24.11	24.19	24.28	24.36	24.44	24.53	24.61	24.70	24.78	24.87	24.95	25.03	25.12
	Forearm	23.50	23.58	23.66	23.74	23.82	23.90	23.98	24.06	24.14	24.22	24.30	24.38	24.46	24.54	24.62	24.70	24.78	24.86	24.94	25.02
	Thigh	46.54	46.76	46.99	47.22	47.44	47.67	47.89	48.12	48.34	48.57	48.79	49.02	49.24	49.47	49.69	49.92	50.15	50.37	50.60	50.82
	Calf	32.28	32.43	32.58	32.73	32.88	33.04	33.19	33.34	33.49	33.64	33.80	33.95	34.10	34.25	34.40	34.56	34.71	34.86	35.01	35.16
75	Upper arm	23.22	23.30	23.39	23.47	23.56	23.64	23.72	23.81	23.89	23.98	24.06	24.15	24.23	24.31	24.40	24.48	24.57	24.65	24.73	24.82
	Forearm	23.31	23.39	23.47	23.55	23.63	23.71	23.79	23.87	23.95	24.03	24.11	24.19	24.27	24.35	24.43	24.51	24.59	24.67	24.75	24.83
	Thigh	45.97	46.20	46.43	46.65	46.88	47.10	47.33	47.55	47.78	48.00	48.23	48.45	48.68	48.91	49.13	49.36	49.58	49.81	50.03	50.26
	Calf	32.04	32.19	32.34	32.50	32.65	32.80	32.95	33.10	33.26	33.41	33.56	33.71	33.86	34.02	34.17	34.32	34.47	34.63	34.78	34.93
74	Upper arm	22.92	23.00	23.09	23.17	23.26	23.34	23.42	23.51	23.59	23.68	23.76	23.85	23.93	24.01	24.10	24.18	24.27	24.35	24.44	24.52
	Forearm	23.12	23.20	23.28	23.36	23.44	23.52	23.60	23.68	23.76	23.84	23.92	24.00	24.08	24.16	24.24	24.32	24.40	24.48	24.56	24.64
	Thigh	45.41	45.64	45.86	46.09	46.31	46.54	46.76	46.99	47.21	47.44	47.66	47.89	48.12	48.34	48.57	48.79	49.02	49.24	49.47	49.69
	Calf	31.80	31.96	32.11	32.26	32.41	32.56	32.72	32.87	33.02	33.17	33.33	33.48	33.63	33.78	33.93	34.09	34.24	34.39	34.54	34.69
73	Upper arm	22.62	22.70	22.79	22.87	22.96	23.04	23.13	23.21	23.29	23.38	23.46	23.55	23.63	23.71	23.80	23.88	23.97	24.05	24.14	24.22
	Forearm	22.92	23.00	23.08	23.16	23.24	23.32	23.40	23.48	23.56	23.64	23.72	23.80	23.88	23.96	24.04	24.12	24.20	24.28	24.36	24.44
	Thigh	44.85	45.07	45.30	45.52	45.75	45.97	46.20	46.42	46.65	46.88	47.10	47.33	47.56	47.78	48.00	48.23	48.45	48.68	48.90	49.13
	Calf	31.57	31.72	31.87	32.03	32.18	32.33	32.48	32.63	32.79	32.94	33.09	33.24	33.39	33.55	33.70	33.85	34.00	34.15	34.31	34.46
72	Upper arm	22.32	22.40	22.49	22.57	22.66	22.74	22.83	22.91	22.99	23.08	23.16	23.25	23.33	23.42	23.50	23.58	23.67	23.75	23.84	23.92
	Forearm	22.73	22.81	22.89	22.97	23.05	23.13	23.21	23.29	23.37	23.45	23.53	23.61	23.69	23.77	23.85	23.93	24.01	24.09	24.17	24.25
	Thigh	44.28	44.51	44.73	44.96	45.18	45.41	45.63	45.86	46.09	46.31	46.54	46.76	46.99	47.21	47.44	47.66	47.89	48.11	48.34	48.57
	Calf	31.33	31.49	31.64	31.79	31.94	32.09	32.25	32.40	32.55	32.70	32.85	33.01	33.16	33.31	33.46	33.61	33.77	33.92	34.07	34.22
71	Upper arm	22.02	22.10	22.19	22.27	22.36	22.44	22.53	22.61	22.69	22.78	22.86	22.95	23.03	23.12	23.20	23.28	23.37	23.45	23.54	23.62
	Forearm	22.54	22.62	22.70	22.78	22.86	22.94	23.02	23.10	23.18	23.26	23.34	23.42	23.50	23.58	23.66	23.74	23.82	23.90	23.98	24.06
	Thigh	43.72	43.94	44.17	44.39	44.62	44.85	45.07	45.30	45.52	45.75	45.97	46.20	46.42	46.65	46.87	47.10	47.33	47.55	47.78	48.00
	Calf	31.10	31.25	31.40	31.55	31.71	31.86	32.01	32.16	32.31	32.47	32.62	32.77	32.92	33.07	33.23	33.38	33.53	33.68	33.83	33.99

Interpolation Table

Chest Circumference, Centimeters	Knee .0	.1
Upper Arm		
.1	.03	.07
.2	.06	.10
.3	.09	.13
.4	.12	.16
.5	.15	.19
.6	.18	.22
.7	.21	.25
.8	.24	.28
.9	.27	.31
Forearm		
.1	.02	.06
.2	.04	.08
.3	.06	.10
.4	.08	.12
.5	.10	.14
.6	.12	.16
.7	.14	.18
.8	.16	.20
.9	.18	.22
Thigh		
.1	.06	.16
.2	.11	.22
.3	.17	.28
.4	.23	.34
.5	.28	.40
.6	.34	.45
.7	.40	.51
.8	.46	.57
.9	.51	.62
Calf		
.1	.02	.10
.2	.05	.13
.3	.07	.15
.4	.09	.17
.5	.12	.19
.6	.14	.22
.7	.16	.24
.8	.19	.27
.9	.22	.30

Table 111

Norms for Upper Arm and Forearm of Four-Year-Old Girls (Upper arm = .2664 chest circumference + .7509 elbow - .7385; forearm = .2594 chest circumference + 1.0700 elbow - 1.7962)

Chest Circumference, Centimeters		Elbow Width, Centimeters																		
		3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4
58	UA	17.42	17.49	17.51	17.64	17.72	17.79	17.87	17.94	18.02	18.09	18.17	18.24	18.32	18.39	18.47	18.54	18.62	18.69	18.77
	FA	17.10	17.21	17.32	17.42	17.53	17.64	17.74	17.85	17.96	18.06	18.17	18.28	18.39	18.49	18.60	18.71	18.81	18.92	19.03
57	UA	17.15	17.22	17.30	17.37	17.45	17.52	17.60	17.68	17.75	17.83	17.90	17.98	18.05	18.13	18.20	18.28	18.35	18.43	18.50
	FA	16.84	16.95	17.06	17.16	17.27	17.38	17.48	17.59	17.70	17.80	17.91	18.02	18.13	18.23	18.34	18.45	18.55	18.66	18.77
56	UA	16.98	16.96	17.03	17.11	17.18	17.26	17.33	17.41	17.48	17.56	17.63	17.71	17.78	17.86	17.93	18.01	18.08	18.16	18.23
	FA	16.58	16.69	16.80	16.90	17.01	17.12	17.22	17.33	17.44	17.55	17.65	17.76	17.87	17.97	18.08	18.19	18.29	18.40	18.51
55	UA	16.62	16.69	16.77	16.84	16.92	16.99	17.07	17.14	17.22	17.29	17.37	17.44	17.52	17.59	17.67	17.74	17.82	17.89	17.97
	FA	16.32	16.43	16.54	16.64	16.75	16.86	16.96	17.07	17.18	17.29	17.39	17.50	17.61	17.71	17.82	17.93	18.03	18.14	18.25
54	UA	16.35	16.43	16.50	16.58	16.65	16.73	16.80	16.88	16.95	17.03	17.10	17.18	17.25	17.33	17.40	17.48	17.55	17.63	17.70
	FA	16.06	16.17	16.28	16.38	16.49	16.60	16.71	16.81	16.92	17.03	17.13	17.24	17.35	17.45	17.56	17.67	17.78	17.88	17.99
53	UA	16.08	16.15	16.23	16.31	16.38	16.46	16.53	16.61	16.68	16.76	16.83	16.91	16.99	17.06	17.14	17.21	17.29	17.36	17.44
	FA	15.80	15.91	16.02	16.13	16.23	16.34	16.45	16.55	16.66	16.77	16.87	16.98	17.09	17.20	17.30	17.41	17.52	17.62	17.73
52	UA	15.82	15.89	15.97	16.04	16.12	16.19	16.27	16.34	16.42	16.49	16.57	16.64	16.72	16.79	16.87	16.94	17.02	17.09	17.17
	FA	15.54	15.65	15.76	15.87	15.97	16.08	16.19	16.29	16.40	16.51	16.61	16.72	16.83	16.94	17.04	17.15	17.26	17.36	17.47
51	UA	15.55	15.63	15.70	15.78	15.85	15.93	16.00	16.08	16.15	16.23	16.30	16.38	16.45	16.53	16.60	16.68	16.75	16.83	16.90
	FA	15.29	15.39	15.50	15.61	15.71	15.82	15.93	16.03	16.14	16.25	16.36	16.46	16.57	16.68	16.78	16.89	17.00	17.10	17.21
50	UA	15.28	15.36	15.43	15.51	15.59	15.66	15.74	15.81	15.89	15.96	16.04	16.11	16.19	16.26	16.34	16.41	16.49	16.56	16.64
	FA	15.03	15.13	15.24	15.35	15.45	15.56	15.67	15.77	15.88	15.99	16.10	16.20	16.31	16.42	16.52	16.63	16.74	16.84	16.95
49	UA	15.02	15.09	15.17	15.24	15.32	15.39	15.47	15.54	15.62	15.69	15.77	15.84	15.92	15.99	16.07	16.14	16.22	16.29	16.37
	FA	14.77	14.87	14.98	15.09	15.19	15.30	15.41	15.52	15.62	15.73	15.84	15.94	16.05	16.16	16.26	16.37	16.48	16.59	16.69
48	UA	14.75	14.83	14.90	14.98	15.05	15.13	15.20	15.28	15.35	15.42	15.50	15.58	15.65	15.73	15.80	15.88	15.95	16.03	16.10
	FA	14.51	14.61	14.72	14.83	14.94	15.04	15.15	15.26	15.36	15.47	15.58	15.68	15.79	15.90	16.01	16.11	16.22	16.33	16.43
47	UA	14.49	14.56	14.64	14.71	14.79	14.86	14.94	15.01	15.09	15.16	15.24	15.31	15.39	15.46	15.54	15.61	15.69	15.76	15.84
	FA	14.25	14.35	14.46	14.57	14.68	14.78	14.89	15.00	15.10	15.21	15.32	15.42	15.53	15.64	15.75	15.85	15.96	16.07	16.17
46	UA	14.22	14.29	14.37	14.44	14.52	14.59	14.67	14.74	14.82	14.89	14.97	15.05	15.12	15.20	15.27	15.35	15.42	15.50	15.57
	FA	13.99	14.10	14.20	14.31	14.42	14.52	14.63	14.74	14.84	14.95	15.06	15.17	15.27	15.38	15.49	15.59	15.70	15.81	15.91

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Fore-arm
	0	0
0	0	0
.1	.03	.03
.2	.05	.05
.3	.08	.08
.4	.11	.10
.5	.13	.13
.6	.16	.16
.7	.19	.18
.8	.21	.21
.9	.24	.23

Table 112

Norms for Thigh and Calf of Four-Year-Old Girls (Thigh = .6525 chest circumference + 1.2937 knee - 9.8552; calf = .4164 chest circumference + .6980 knee - 4.2990)

Chest Circumference, Centimeters		Knee Width, Centimeters													
		5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2
58	Th	35.23	35.49	35.75	36.01	36.27	36.53	36.79	37.05	37.30	37.56	37.82	38.08	38.34	38.60
	Ca	23.76	23.90	24.04	24.18	24.32	24.46	24.60	24.74	24.88	25.02	25.16	25.30	25.44	25.58
57	Th	34.58	34.84	35.10	35.36	35.62	35.88	36.13	36.39	36.65	36.91	37.17	37.43	37.69	37.95
	Ca	23.34	23.48	23.62	23.76	23.90	24.04	24.18	24.32	24.46	24.60	24.74	24.88	25.02	25.16
56	Th	33.93	34.19	34.45	34.71	34.96	35.22	35.48	35.74	36.00	36.26	36.52	36.78	37.03	37.29
	Ca	22.93	23.07	23.21	23.35	23.49	23.63	23.77	23.91	24.05	24.18	24.32	24.46	24.60	24.74
55	Th	33.28	33.54	33.79	34.05	34.31	34.57	34.83	35.09	35.35	35.61	35.86	36.12	36.38	36.64
	Ca	22.51	22.65	22.79	22.93	23.07	23.21	23.35	23.49	23.63	23.77	23.91	24.05	24.19	24.33
54	Th	32.62	32.88	33.14	33.40	33.66	33.92	34.18	34.44	34.69	34.95	35.21	35.47	35.72	35.99
	Ca	22.10	22.24	22.37	22.51	22.65	22.79	22.93	23.07	23.21	23.35	23.49	23.63	23.77	23.91
53	Th	31.97	32.23	32.49	32.75	33.01	33.27	33.52	33.78	34.04	34.30	34.56	34.82	35.08	35.34
	Ca	21.68	21.82	21.96	22.10	22.24	22.38	22.52	22.66	22.80	22.94	23.08	23.21	23.35	23.49
52	Th	31.32	31.58	31.84	32.10	32.35	32.61	32.87	33.13	33.39	33.65	33.91	34.17	34.42	34.68
	Ca	21.26	21.40	21.54	21.68	21.82	21.96	22.10	22.24	22.38	22.52	22.66	22.80	22.94	23.08
51	Th	30.67	30.93	31.18	31.44	31.70	31.96	32.22	32.48	32.74	33.00	33.25	33.51	33.77	34.03
	Ca	20.85	20.99	21.13	21.27	21.40	21.54	21.68	21.82	21.96	22.10	22.24	22.38	22.52	22.66
50	Th	30.01	30.27	30.53	30.79	31.05	31.31	31.57	31.83	32.09	32.34	32.60	32.86	33.12	33.37
	Ca	20.43	20.57	20.71	20.85	20.99	21.13	21.27	21.41	21.55	21.69	21.83	21.97	22.11	22.24
49	Th	29.36	29.62	29.88	30.14	30.40	30.66	30.91	31.17	31.43	31.69	31.95	32.21	32.47	32.73
	Ca	20.01	20.15	20.29	20.43	20.57	20.71	20.85	20.99	21.13	21.27	21.41	21.55	21.69	21.83
48	Th	28.71	28.97	29.23	29.49	29.74	30.00	30.26	30.52	30.78	31.04	31.30	31.56	31.81	32.07
	Ca	19.60	19.74	19.88	20.02	20.16	20.29	20.43	20.57	20.71	20.85	20.99	21.13	21.27	21.41
47	Th	28.06	28.32	28.57	28.83	29.09	29.35	29.61	29.87	30.13	30.39	30.64	30.90	31.16	31.42
	Ca	19.18	19.32	19.46	19.60	19.74	19.88	20.02	20.16	20.30	20.44	20.58	20.72	20.86	21.00
46	Th	27.40	27.66	27.92	28.18	28.44	28.70	28.96	29.22	29.47	29.73	29.99	30.25	30.51	30.77
	Ca	18.76	18.90	19.04	19.18	19.32	19.46	19.60	19.74	19.88	20.02	20.16	20.30	20.44	20.58

Interpolation Table

Chest Circumference	Knee	
	Thigh 0	Calf 0
0	0	0
.1	.065	.042
.2	.131	.083
.3	.196	.125
.4	.261	.167
.5	.326	.208
.6	.392	.250
.7	.457	.291
.8	.522	.333
.9	.587	.375

Table 113

Norms for Upper Arm and Forearm of Five-Year-Old Girls (Upper arm = .2747 chest circumference + 1.5644 elbow - 4.9360; forearm = .1786 chest circumference + 1.3974 elbow + .6216)

Chest Circumference, Centimeters		Elbow Width, Centimeters																	
		3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5
63	UA	18.31	18.47	18.63	18.78	18.94	19.10	19.25	19.41	19.57	19.72	19.88	20.04	20.19	20.35	20.50	20.66	20.82	20.97
	FA	17.38	17.52	17.66	17.80	17.94	18.08	18.22	18.36	18.50	18.64	18.78	18.92	19.06	19.20	19.34	19.48	19.62	19.76
62	UA	18.04	18.20	18.35	18.51	18.67	18.82	18.98	19.14	19.29	19.45	19.60	19.76	19.92	20.07	20.23	20.39	20.54	20.70
	FA	17.20	17.34	17.48	17.62	17.76	17.90	18.04	18.18	18.32	18.46	18.60	18.74	18.88	19.02	19.16	19.30	19.44	19.58
61	UA	17.77	17.92	18.08	18.23	18.39	18.55	18.70	18.86	19.02	19.17	19.33	19.49	19.64	19.80	19.96	20.11	20.27	20.42
	FA	17.03	17.17	17.31	17.45	17.59	17.73	17.86	18.00	18.14	18.28	18.42	18.56	18.70	18.84	18.98	19.12	19.26	19.40
60	UA	17.49	17.65	17.80	17.96	18.12	18.27	18.43	18.59	18.74	18.90	19.06	19.21	19.37	19.52	19.68	19.84	19.99	20.15
	FA	16.85	16.99	17.13	17.27	17.41	17.55	17.69	17.83	17.97	18.11	18.25	18.38	18.52	18.66	18.80	18.94	19.08	19.22
59	UA	17.22	17.37	17.53	17.69	17.84	18.00	18.15	18.31	18.47	18.62	18.78	18.94	19.09	19.25	19.41	19.56	19.72	19.88
	FA	16.67	16.81	16.95	17.09	17.23	17.37	17.51	17.65	17.79	17.93	18.07	18.21	18.35	18.49	18.63	18.77	18.90	19.04
58	UA	16.94	17.10	17.25	17.41	17.57	17.72	17.88	18.04	18.19	18.35	18.51	18.66	18.82	18.98	19.13	19.29	19.44	19.60
	FA	16.49	16.63	16.77	16.91	17.05	17.19	17.33	17.47	17.61	17.75	17.89	18.03	18.17	18.31	18.45	18.59	18.73	18.87
57	UA	16.67	16.82	16.98	17.14	17.29	17.45	17.61	17.76	17.92	18.07	18.23	18.39	18.54	18.70	18.86	19.01	19.17	19.33
	FA	16.31	16.45	16.59	16.73	16.87	17.01	17.15	17.29	17.43	17.57	17.71	17.85	17.99	18.13	18.27	18.41	18.55	18.69
56	UA	16.39	16.55	16.70	16.86	17.02	17.17	17.33	17.49	17.64	17.80	17.96	18.11	18.27	18.43	18.58	18.74	18.89	19.05
	FA	16.13	16.27	16.41	16.55	16.69	16.83	16.97	17.11	17.25	17.39	17.53	17.67	17.81	17.95	18.09	18.23	18.37	18.51
55	UA	16.12	16.27	16.43	16.59	16.74	16.90	17.06	17.21	17.37	17.53	17.68	17.84	17.99	18.15	18.31	18.46	18.62	18.78
	FA	15.95	16.09	16.23	16.37	16.51	16.65	16.79	16.93	17.07	17.21	17.35	17.49	17.63	17.77	17.91	18.05	18.19	18.33
54	UA	15.84	16.00	16.16	16.31	16.47	16.62	16.78	16.94	17.09	17.25	17.41	17.56	17.72	17.88	18.03	18.19	18.35	18.50
	FA	15.78	15.92	16.06	16.20	16.34	16.47	16.61	16.75	16.89	17.03	17.17	17.31	17.45	17.59	17.73	17.87	18.01	18.15
53	UA	15.57	15.72	15.88	16.04	16.19	16.35	16.51	16.66	16.82	16.98	17.13	17.29	17.45	17.60	17.76	17.91	18.07	18.23
	FA	15.60	15.74	15.88	16.02	16.16	16.30	16.44	16.58	16.72	16.86	16.99	17.13	17.27	17.41	17.55	17.69	17.83	17.97
52	UA	15.29	15.45	15.61	15.76	15.92	16.08	16.23	16.39	16.54	16.70	16.86	17.01	17.17	17.33	17.48	17.64	17.80	17.95
	FA	15.42	15.56	15.70	15.84	15.98	16.12	16.26	16.40	16.54	16.68	16.82	16.96	17.10	17.24	17.38	17.52	17.65	17.79
51	UA	15.02	15.17	15.33	15.49	15.64	15.80	15.96	16.11	16.27	16.43	16.58	16.74	16.90	17.05	17.21	17.37	17.52	17.68
	FA	15.24	15.38	15.52	15.66	15.80	15.94	16.08	16.22	16.36	16.50	16.64	16.78	16.92	17.06	17.20	17.34	17.48	17.62
50	UA	14.74	14.90	15.06	15.21	15.37	15.53	15.68	15.84	16.00	16.15	16.31	16.46	16.62	16.78	16.93	17.09	17.25	17.40
	FA	15.06	15.20	15.34	15.48	15.62	15.76	15.90	16.04	16.18	16.32	16.46	16.60	16.74	16.88	17.02	17.16	17.30	17.44
49	UA	14.47	14.63	14.78	14.94	15.09	15.25	15.41	15.56	15.72	15.88	16.03	16.19	16.35	16.50	16.66	16.82	16.97	17.13
	FA	14.88	15.02	15.16	15.30	15.44	15.58	15.72	15.86	16.00	16.14	16.28	16.42	16.56	16.70	16.84	16.98	17.12	17.26
48	UA	14.19	14.35	14.51	14.66	14.82	14.98	15.13	15.29	15.45	15.60	15.76	15.92	16.07	16.23	16.38	16.54	16.70	16.85
	FA	14.70	14.84	14.98	15.12	15.26	15.40	15.54	15.68	15.82	15.96	16.10	16.24	16.38	16.52	16.66	16.80	16.94	17.08
47	UA	13.92	14.08	14.23	14.39	14.55	14.70	14.86	15.02	15.17	15.33	15.48	15.64	15.80	15.95	16.11	16.27	16.42	16.58
	FA	14.53	14.67	14.81	14.95	15.08	15.22	15.36	15.50	15.64	15.78	15.92	16.06	16.20	16.34	16.48	16.62	16.76	16.90
46	UA	13.64	13.80	13.96	14.11	14.27	14.43	14.58	14.74	14.90	15.05	15.21	15.37	15.52	15.68	15.84	15.99	16.15	16.30
	FA	14.35	14.49	14.63	14.77	14.91	15.05	15.19	15.33	15.47	15.60	15.74	15.88	16.02	16.16	16.30	16.44	16.58	16.72
45	UA	13.37	13.53	13.68	13.84	14.00	14.15	14.31	14.47	14.62	14.78	14.93	15.09	15.25	15.40	15.56	15.72	15.87	16.03
	FA	14.17	14.31	14.45	14.59	14.73	14.87	15.01	15.15	15.29	15.43	15.57	15.71	15.85	15.99	16.13	16.26	16.40	16.54

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.027	.018
.2	.055	.036
.3	.082	.054
.4	.110	.071
.5	.137	.089
.6	.165	.107
.7	.192	.125
.8	.220	.143
.9	.247	.161

Table 114

Norms for Thigh and Calf of Five-Year-Old Girls (Thigh = .6042 chest circumference + 1.5007 knee - 8.7333; calf = .3320 chest circumference + 1.2526 knee - 3.5361)

Chest Circumference, Centimeters		Knee Width, Centimeters														
		5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6
63	Th	38.04	38.34	38.64	38.94	39.24	39.54	39.84	40.14	40.44	40.74	41.04	41.34	41.64	41.94	42.24
	Ca	24.64	24.90	25.15	25.40	25.65	25.90	26.15	26.40	26.65	26.90	27.15	27.40	27.65	27.90	28.15
62	Th	37.43	37.73	38.03	38.33	38.63	38.93	39.23	39.53	39.83	40.13	40.43	40.73	41.03	41.33	41.63
	Ca	24.31	24.56	24.81	25.06	25.32	25.57	25.82	26.07	26.32	26.57	26.82	27.07	27.32	27.57	27.82
61	Th	36.83	37.13	37.43	37.73	38.03	38.33	38.63	38.93	39.23	39.53	39.83	40.13	40.43	40.73	41.03
	Ca	23.98	24.23	24.48	24.73	24.98	25.23	25.48	25.73	25.99	26.24	26.49	26.74	26.99	27.24	27.49
60	Th	36.22	36.52	36.82	37.12	37.42	37.72	38.02	38.32	38.62	38.92	39.22	39.52	39.82	40.12	40.42
	Ca	23.65	23.90	24.15	24.40	24.65	24.90	25.15	25.40	25.65	25.90	26.15	26.40	26.66	26.91	27.16
59	Th	35.62	35.92	36.22	36.52	36.82	37.12	37.42	37.72	38.02	38.32	38.62	38.92	39.22	39.52	39.82
	Ca	23.32	23.57	23.82	24.07	24.32	24.57	24.82	25.07	25.32	25.57	25.82	26.07	26.32	26.57	26.82
58	Th	35.01	35.31	35.61	35.91	36.21	36.52	36.82	37.12	37.42	37.72	38.02	38.32	38.62	38.92	39.22
	Ca	22.98	23.24	23.49	23.74	23.99	24.24	24.49	24.74	24.99	25.24	25.49	25.74	25.99	26.24	26.49
57	Th	34.41	34.71	35.01	35.31	35.61	35.91	36.21	36.51	36.81	37.11	37.41	37.71	38.01	38.31	38.61
	Ca	22.65	22.90	23.15	23.40	23.66	23.91	24.16	24.41	24.66	24.91	25.16	25.41	25.66	25.91	26.16
56	Th	33.81	34.11	34.41	34.71	35.01	35.31	35.61	35.91	36.21	36.51	36.81	37.11	37.41	37.71	38.01
	Ca	22.32	22.57	22.82	23.07	23.32	23.57	23.82	24.07	24.83	24.58	24.83	25.08	25.33	25.58	26.83
55	Th	33.20	33.50	33.80	34.10	34.40	34.70	35.00	35.30	35.60	35.90	36.20	36.50	36.80	37.10	37.40
	Ca	21.99	22.24	22.49	22.74	22.99	23.24	23.49	23.74	23.99	24.24	24.49	24.74	25.00	25.25	25.50
54	Th	32.60	32.90	33.20	33.50	33.80	34.10	34.40	34.70	35.00	35.30	35.60	35.90	36.20	36.50	36.80
	Ca	21.66	21.91	22.16	22.41	22.66	22.91	23.16	23.41	23.66	23.91	24.16	24.41	24.66	24.91	25.16
53	Th	31.99	32.29	32.59	32.89	33.19	33.49	33.79	34.09	34.39	34.69	34.99	35.29	35.60	35.90	36.20
	Ca	21.32	21.58	21.83	22.08	22.33	22.58	22.83	23.08	23.33	23.58	23.83	24.08	24.33	24.58	24.83
52	Th	31.39	31.69	31.99	32.29	32.59	32.89	33.19	33.49	33.79	34.09	34.39	34.69	34.99	35.29	35.59
	Ca	20.99	21.24	21.49	21.74	22.00	22.25	22.50	22.75	23.00	23.25	23.50	23.75	24.00	24.25	24.50
51	Th	30.78	31.09	31.39	31.69	31.99	32.29	32.59	32.89	33.19	33.49	33.79	34.09	34.39	34.68	34.99
	Ca	20.66	20.91	21.16	21.41	21.66	21.91	22.16	22.41	22.67	22.92	23.17	23.42	23.67	23.92	24.17
50	Th	30.18	30.48	30.78	31.08	31.38	31.68	31.98	32.28	32.58	32.88	33.18	33.48	33.78	34.08	34.38
	Ca	20.33	20.58	20.83	21.08	21.33	21.58	21.83	22.08	22.33	22.58	22.83	23.08	23.34	23.58	23.84
49	Th	29.58	29.88	30.18	30.48	30.78	31.08	31.38	31.69	31.98	32.28	32.58	32.88	33.18	33.48	33.78
	Ca	20.00	20.25	20.50	20.75	21.00	21.25	21.50	21.75	22.00	22.25	22.50	22.75	23.00	23.25	23.50
48	Th	28.97	29.27	29.57	29.87	30.17	.30.47	30.77	31.07	31.37	31.67	31.97	32.27	32.57	32.87	33.17
	Ca	19.66	19.92	20.17	20.42	20.67	20.92	21.17	21.42	21.67	21.92	22.17	22.42	22.67	22.92	23.17
47	Th	28.37	28.67	28.97	29.27	29.57	29.87	30.17	30.47	30.77	31.07	31.37	31.67	31.97	32.27	32.57
	Ca	19.33	19.58	19.83	20.08	20.34	20.59	20.84	21.09	21.34	21.59	21.84	22.09	22.34	22.59	22.84
46	Th	27.76	28.06	28.36	28.66	28.96	29.26	29.56	29.86	30.17	30.47	30.77	31.07	31.37	31.67	31.97
	Ca	19.00	19.25	19.50	19.75	20.00	20.25	20.50	20.75	21.01	21.26	21.51	21.76	22.00	22.26	22.51
45	Th	27.16	27.46	27.76	28.06	28.36	28.66	28.96	29.26	29.56	29.86	30.16	30.46	30.76	31.06	31.36
	Ca	18.67	18.92	19.17	19.42	19.67	19.92	20.17	20.42	20.67	20.92	21.17	21.42	21.68	21.93	22.18

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.150	0	.125
.1	.060	.210	.033	.158
.2	.121	.271	.066	.192
.3	.181	.331	.100	.225
.4	.242	.392	.133	.258
.5	.302	.452	.166	.291
.6	.363	.513	.199	.324
.7	.423	.573	.232	.358
.8	.483	.633	.266	.391
..9	.544	.694	.299	.424

Table 115

Norms for Upper Arm and Forearm of Six-Year-Old Girls (Upper arm = .2498 chest circumference + 1.5115 elbow - 3.6387; forearm = .1739 chest circumference + 1.3956 elbow + .9136)

Chest Circumference, Centimeters		Elbow Width, Centimeters																
		4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6
64	UA	18.39	18.55	18.70	18.85	19.00	19.15	19.30	19.45	19.60	19.75	19.91	20.06	20.21	20.36	20.51	20.66	20.81
	FA	17.63	17.77	17.90	18.04	18.18	18.32	18.46	18.60	18.74	18.88	19.02	19.16	19.30	19.44	19.58	19.72	19.86
63	UA	18.14	18.30	18.45	18.60	18.75	18.90	19.05	19.20	19.35	19.51	19.66	19.81	19.96	20.11	20.26	20.41	20.56
	FA	17.45	17.59	17.73	17.87	18.01	18.15	18.29	18.43	18.57	18.71	18.85	18.99	19.13	19.27	19.41	19.55	19.69
62	UA	17.89	18.05	18.20	18.35	18.50	18.65	18.80	18.95	19.10	19.26	19.41	19.56	19.71	19.86	20.01	20.16	20.31
	FA	17.28	17.42	17.56	17.70	17.84	17.98	18.12	18.25	18.39	18.53	18.67	18.81	18.95	19.09	19.23	19.37	19.51
61	UA	17.65	17.80	17.95	18.10	18.25	18.40	18.55	18.70	18.85	19.01	19.16	19.31	19.46	19.61	19.76	19.91	20.06
	FA	17.10	17.24	17.38	17.52	17.66	17.80	17.94	18.08	18.22	18.36	18.50	18.64	18.78	18.92	19.06	19.20	19.34
60	UA	17.40	17.55	17.70	17.85	18.00	18.15	18.30	18.45	18.60	18.76	18.91	19.06	19.21	19.36	19.51	19.66	19.81
	FA	16.93	17.07	17.21	17.35	17.49	17.63	17.77	17.91	18.05	18.19	18.33	18.47	18.60	18.74	18.88	19.02	19.16
59	UA	17.15	17.30	17.45	17.60	17.75	17.90	18.05	18.20	18.35	18.51	18.66	18.81	18.96	19.11	19.26	19.41	19.56
	FA	16.76	16.90	17.04	17.17	17.31	17.45	17.59	17.73	17.87	18.01	18.15	18.29	18.43	18.57	18.71	18.85	18.99
58	UA	16.90	17.05	17.20	17.35	17.50	17.65	17.80	17.95	18.10	18.26	18.41	18.56	18.71	18.86	19.01	19.16	19.31
	FA	16.58	16.72	16.86	17.00	17.14	17.28	17.42	17.56	17.70	17.84	17.98	18.12	18.26	18.40	18.54	18.68	18.82
57	UA	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.86	18.01	18.16	18.31	18.46	18.61	18.76	18.91	19.06
	FA	16.41	16.55	16.69	16.83	16.97	17.11	17.25	17.39	17.52	17.66	17.80	17.94	18.08	18.22	18.36	18.50	18.64
56	UA	16.40	16.55	16.70	16.85	17.00	17.15	17.30	17.45	17.61	17.76	17.91	18.06	18.21	18.36	18.51	18.66	18.81
	FA	16.23	16.37	16.51	16.65	16.79	16.93	17.07	17.21	17.35	17.49	17.63	17.77	17.91	18.05	18.19	18.33	18.47
55	UA	16.15	16.30	16.45	16.60	16.75	16.90	17.05	17.20	17.36	17.51	17.66	17.81	17.96	18.11	18.26	18.41	18.56
	FA	16.06	16.20	16.34	16.48	16.62	16.76	16.90	17.04	17.18	17.32	17.46	17.60	17.74	17.87	18.01	18.15	18.29
54	UA	15.90	16.05	16.20	16.35	16.50	16.65	16.80	16.95	17.11	17.26	17.41	17.56	17.71	17.86	18.01	18.16	18.31
	FA	15.89	16.03	16.17	16.31	16.44	16.58	16.72	16.86	17.00	17.14	17.28	17.42	17.56	17.70	17.84	17.98	18.12
53	UA	15.65	15.80	15.95	16.10	16.25	16.40	16.55	16.70	16.86	17.01	17.16	17.31	17.46	17.61	17.76	17.91	18.07
	FA	15.71	15.85	15.99	16.13	16.27	16.41	16.55	16.69	16.83	16.97	17.11	17.25	17.39	17.53	17.67	17.81	17.95
52	UA	15.40	15.55	15.70	15.85	16.00	16.15	16.30	16.45	16.61	16.76	16.91	17.06	17.21	17.36	17.51	17.66	17.82
	FA	15.54	15.68	15.82	15.96	16.10	16.24	16.38	16.52	16.66	16.79	16.93	17.07	17.21	17.35	17.49	17.63	17.77
51	UA	15.15	15.30	15.45	15.60	15.75	15.90	16.05	16.21	16.36	16.51	16.66	16.81	16.96	17.11	17.26	17.41	17.57
	FA	15.36	15.50	15.64	15.78	15.92	16.06	16.20	16.34	16.48	16.62	16.76	16.90	17.04	17.18	17.32	17.46	17.60
50	UA	14.90	15.05	15.20	15.35	15.50	15.65	15.80	15.96	16.11	16.26	16.41	16.56	16.71	16.86	17.01	17.16	17.32
	FA	15.19	15.33	15.47	15.61	15.75	15.89	16.03	16.17	16.31	16.45	16.59	16.73	16.87	17.01	17.14	17.28	17.42
49	UA	14.65	14.80	14.95	15.10	15.25	15.40	15.55	15.71	15.86	16.01	16.16	16.31	16.46	16.61	16.76	16.91	17.07
	FA	15.02	15.16	15.30	15.44	15.58	15.71	15.85	15.99	16.13	16.27	16.41	16.55	16.69	16.83	16.97	17.11	17.25
48	UA	14.40	14.55	14.70	14.85	15.00	15.15	15.30	15.46	15.61	15.76	15.91	16.06	16.21	16.36	16.51	16.66	16.82
	FA	14.84	14.98	15.12	15.26	15.40	15.54	15.68	15.82	15.96	16.10	16.24	16.38	16.52	16.66	16.80	16.94	17.08
47	UA	14.15	14.30	14.45	14.60	14.75	14.90	15.05	15.21	15.36	15.51	15.66	15.81	15.96	16.11	16.26	16.42	16.57
	FA	14.67	14.81	14.95	15.09	15.23	15.37	15.51	15.65	15.79	15.93	16.06	16.20	16.34	16.48	16.62	16.76	16.90
46	UA	13.90	14.05	14.20	14.35	14.50	14.65	14.81	14.96	15.11	15.26	15.41	15.56	15.71	15.86	16.01	16.17	16.32
	FA	14.50	14.63	14.77	14.91	15.05	15.19	15.33	15.47	15.61	15.75	15.89	16.03	16.17	16.31	16.45	16.59	16.73

Interpolation Table

Chest Circumference	Elbow Upper Arm	Elbow Forearm
	0	0
0	0	0
.1	.025	.017
.2	.050	.035
.3	.075	.052
.4	.100	.070
.5	.125	.087
.6	.150	.104
.7	.175	.122
.8	.200	.139
.9	.225	.157

Table 116

Norms for Thigh and Calf of Six-Year-Old Girls (Thigh = .6064 chest circumference + .8933 knee - 4.3130; calf = .3176 chest circumference + 1.1673 knee - 2.0208)

Chest Circumference, Centimeters		Knee Width, Centimeters														
		5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6
64	Th	39.68	39.86	40.04	40.21	40.39	40.57	40.75	40.93	41.11	41.29	41.46	41.64	41.82	42.00	42.18
	Ca	25.08	25.31	25.54	25.78	26.01	26.24	26.48	26.71	26.94	27.18	27.41	27.64	27.88	28.11	28.34
63	Th	39.07	39.25	39.43	39.61	39.79	39.96	40.14	40.32	40.50	40.68	40.86	41.04	41.22	41.39	41.57
	Ca	24.76	24.99	25.23	25.46	25.69	25.92	26.16	26.39	26.63	26.86	27.09	27.33	27.56	27.79	28.03
62	Th	38.46	38.64	38.82	39.00	39.18	39.36	39.54	39.72	39.89	40.07	40.25	40.43	40.61	40.78	40.97
	Ca	24.44	24.67	24.91	25.14	25.37	25.61	25.84	26.07	26.31	26.54	26.78	27.01	27.24	27.48	27.71
61	Th	37.86	38.04	38.22	38.39	38.57	38.75	38.93	39.11	39.29	39.47	39.65	39.82	40.00	40.18	40.36
	Ca	24.12	24.36	24.59	24.82	25.06	25.29	25.52	25.76	25.99	26.22	26.46	26.69	26.92	27.16	27.39
60	Th	37.25	37.43	37.61	37.79	37.97	38.15	38.32	38.50	38.68	38.86	39.04	39.22	39.40	39.57	39.75
	Ca	23.81	24.04	24.27	24.51	24.74	24.97	25.21	25.44	25.67	25.91	26.14	26.37	26.61	26.84	27.07
59	Th	36.65	36.82	37.00	37.18	37.36	37.54	37.72	37.90	38.08	38.25	38.43	38.61	38.79	38.97	39.15
	Ca	23.49	23.72	23.95	24.19	24.42	24.66	24.89	25.12	25.36	25.59	25.82	26.06	26.29	26.52	26.76
58	Th	36.04	36.22	36.40	36.58	36.75	36.93	37.11	37.29	37.47	37.65	37.83	38.00	38.18	38.36	38.54
	Ca	23.17	23.40	23.64	23.87	24.10	24.34	24.57	24.80	25.04	25.27	25.50	25.74	25.97	26.21	26.44
57	Th	35.43	35.61	35.79	35.97	36.15	36.33	36.50	36.68	36.86	37.04	37.22	37.40	37.58	37.76	37.93
	Ca	22.85	23.09	23.32	23.55	23.79	24.02	24.25	24.49	24.72	24.95	25.19	25.42	25.65	25.89	26.12
56	Th	34.83	35.01	35.18	35.36	35.54	35.72	35.90	36.08	36.26	36.43	36.61	36.79	36.97	37.15	37.33
	Ca	22.54	22.77	23.00	23.24	23.47	23.70	23.94	24.17	24.40	24.64	24.87	25.10	25.34	25.57	25.80
55	Th	34.22	34.40	34.58	34.76	34.93	35.11	35.29	35.47	35.65	35.83	36.01	36.19	36.36	36.54	36.72
	Ca	22.22	22.45	22.68	22.92	23.15	23.38	23.62	23.85	24.09	24.32	24.55	24.79	25.02	25.25	25.49
54	Th	33.61	33.79	33.97	34.15	34.33	34.51	34.69	34.86	35.04	35.22	35.40	35.58	35.76	35.94	36.11
	Ca	21.90	22.13	22.37	22.60	22.83	23.07	23.30	23.53	23.77	24.00	24.23	24.47	24.70	24.93	25.17
53	Th	33.01	33.19	33.36	33.54	33.72	33.90	34.08	34.26	34.44	34.62	34.79	34.97	35.15	35.33	35.51
	Ca	21.58	21.82	22.05	22.28	22.52	22.75	22.98	23.22	23.45	23.68	23.92	24.15	24.38	24.62	24.85
52	Th	32.40	32.58	32.76	32.94	33.12	33.29	33.47	33.65	33.83	34.01	34.19	34.37	34.54	34.72	34.90
	Ca	21.26	21.50	21.73	21.97	22.20	22.43	22.67	22.90	23.13	23.37	23.60	23.83	24.07	24.30	24.53
51	Th	31.79	31.97	32.15	32.33	32.51	32.69	32.87	33.05	33.22	33.40	33.58	33.76	33.94	34.12	34.30
	Ca	20.95	21.18	21.41	21.65	21.88	22.11	22.35	22.58	22.81	23.05	23.28	23.52	23.75	23.98	24.22
50	Th	31.19	31.37	31.55	31.72	31.90	32.08	32.26	32.44	32.62	32.80	32.97	33.15	33.33	33.51	33.69
	Ca	20.63	20.86	21.10	21.33	21.56	21.80	22.03	22.26	22.50	22.73	22.96	23.20	23.43	23.66	23.90
49	Th	30.58	30.76	30.94	31.12	31.30	31.48	31.65	31.83	32.01	32.19	32.37	32.55	32.73	32.90	33.09
	Ca	20.31	20.55	20.78	21.01	21.25	21.48	21.71	21.95	22.18	22.41	22.65	22.88	23.11	23.35	23.58
48	Th	29.98	30.15	30.33	30.51	30.69	30.87	31.05	31.23	31.40	31.58	31.76	31.94	32.12	32.30	32.48
	Ca	19.99	20.23	20.46	20.69	20.93	21.16	21.40	21.63	21.86	22.10	22.33	22.56	22.80	23.03	23.26
47	Th	29.37	29.55	29.73	29.90	30.08	30.26	30.44	30.62	30.80	30.98	31.16	31.33	31.51	31.69	31.87
	Ca	19.68	19.91	20.14	20.38	20.61	20.84	21.08	21.31	21.54	21.78	22.01	22.24	22.48	22.71	22.95
46	Th	28.76	28.94	29.12	29.30	29.48	29.66	29.83	30.01	30.19	30.37	30.55	30.73	30.91	31.09	31.26
	Ca	19.36	19.59	19.83	20.06	20.29	20.53	20.76	20.99	21.23	21.46	21.69	21.93	22.16	22.39	22.63

Interpolation Table.

Chest Circumference	Thigh		Calf	
	Knee			
	0	.1	0	.1
0	0	.089	0	.117
.1	.061	.150	.032	.148
.2	.121	.211	.064	.180
.3	.182	.271	.095	.212
.4	.243	.332	.127	.244
.5	.303	.393	.159	.276
.6	.364	.453	.191	.307
.7	.424	.514	.222	.339
.8	.485	.574	.254	.371
.9	.546	.635	.286	.403

Table 117

Norms for Upper Arm and Forearm of Seven-Year-Old Girls (Upper arm = .3768 chest circumference + 1.0637 elbow - 8.6458; forearm = .1906 chest circumference + 1.5256 elbow - .6665)

Chest Circumference, Centimeters		Elbow Width, Centimeters																			
		4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9
67	UA	20.85	20.96	21.07	21.17	21.28	21.39	21.49	21.60	21.71	21.81	21.92	22.02	22.13	22.24	22.34	22.45	22.56	22.66	22.77	22.88
	FA	18.21	18.36	18.51	18.66	18.82	18.97	19.12	19.27	19.43	19.58	19.73	19.88	20.04	20.19	20.34	20.49	20.65	20.80	20.95	21.10
66	UA	20.48	20.58	20.69	20.80	20.90	21.01	21.12	21.22	21.33	21.44	21.54	21.65	21.75	21.86	21.97	22.07	22.18	22.29	22.39	22.50
	FA	18.02	18.17	18.32	18.47	18.63	18.78	18.93	19.08	19.24	19.39	19.54	19.69	19.85	20.00	20.15	20.30	20.46	20.61	20.76	20.91
65	UA	20.10	20.21	20.31	20.42	20.53	20.63	20.74	20.85	20.95	21.06	21.16	21.27	21.38	21.48	21.59	21.70	21.80	21.91	22.02	22.12
	FA	17.82	17.98	18.13	18.28	18.44	18.59	18.74	18.89	19.05	19.20	19.35	19.50	19.66	19.81	19.96	20.11	20.27	20.42	20.57	20.72
64	UA	19.72	19.83	19.94	20.04	20.15	20.26	20.36	20.47	20.59	20.68	20.79	20.89	21.00	21.11	21.21	21.32	21.43	21.53	21.64	21.75
	FA	17.63	17.79	17.94	18.09	18.24	18.40	18.55	18.70	18.85	19.01	19.16	19.31	19.47	19.62	19.77	19.92	20.08	20.23	20.38	20.53
63	UA	19.35	19.45	19.56	19.67	19.77	19.88	19.99	20.09	20.20	20.30	20.41	20.52	20.62	20.73	20.84	20.94	21.05	21.16	21.26	21.37
	FA	17.44	17.60	17.75	17.90	18.05	18.21	18.36	18.51	18.66	18.82	18.97	19.12	19.27	19.43	19.58	19.73	19.88	20.04	20.19	20.34
62	UA	18.97	19.08	19.18	19.29	19.40	19.50	19.61	19.72	19.82	19.93	20.03	20.14	20.25	20.35	20.46	20.57	20.67	20.78	20.89	20.99
	FA	17.25	17.41	17.56	17.71	17.86	18.02	18.17	18.32	18.47	18.63	18.78	18.93	19.08	19.24	19.39	19.54	19.69	19.85	20.00	20.15
61	UA	18.59	18.70	18.81	18.91	19.02	19.13	19.23	19.34	19.44	19.55	19.66	19.76	19.87	19.98	20.08	20.19	20.30	20.40	20.51	20.61
	FA	17.06	17.22	17.37	17.52	17.67	17.83	17.98	18.13	18.28	18.44	18.59	18.74	18.89	19.05	19.20	19.35	19.50	19.66	19.81	19.96
60	UA	18.22	18.32	18.43	18.54	18.64	18.75	18.86	18.96	19.07	19.17	19.28	19.40	19.49	19.60	19.71	19.81	19.92	20.03	20.13	20.24
	FA	16.87	17.02	17.18	17.33	17.48	17.63	17.79	17.94	18.09	18.24	18.40	18.55	18.70	18.86	19.01	19.16	19.31	19.47	19.62	19.77
59	UA	17.84	17.95	18.05	18.16	18.27	18.37	18.48	18.58	18.69	18.80	18.90	19.01	19.12	19.22	19.33	19.44	19.54	19.65	19.75	19.86
	FA	16.68	16.83	16.99	17.14	17.29	17.44	17.60	17.75	17.90	18.05	18.21	18.36	18.51	18.66	18.82	18.97	19.12	19.27	19.43	19.58
58	UA	17.46	17.57	17.68	17.78	17.89	18.00	18.10	18.21	18.31	18.42	18.53	18.63	18.74	18.85	18.95	19.06	19.17	19.27	19.38	19.48
	FA	16.49	16.64	16.80	16.95	17.10	17.25	17.41	17.56	17.71	17.86	18.02	18.17	18.32	18.47	18.63	18.78	18.93	19.08	19.24	19.39
57	UA	17.09	17.19	17.30	17.41	17.51	17.62	17.72	17.83	17.94	18.04	18.15	18.26	18.36	18.47	18.58	18.68	18.79	18.89	19.00	19.11
	FA	16.30	16.45	16.61	16.76	16.91	17.06	17.22	17.37	17.52	17.67	17.83	17.98	18.13	18.28	18.44	18.59	18.74	18.89	19.05	19.20
56	UA	16.71	16.82	16.92	17.03	17.14	17.24	17.35	17.45	17.56	17.67	17.77	17.88	17.99	18.09	18.20	18.31	18.41	18.52	18.62	18.73
	FA	16.11	16.26	16.41	16.57	16.72	16.87	17.02	17.18	17.33	17.48	17.64	17.79	17.94	18.09	18.25	18.40	18.55	18.70	18.86	19.01
55	UA	16.33	16.44	16.55	16.65	16.76	16.86	16.97	17.08	17.18	17.29	17.40	17.50	17.61	17.72	17.82	17.93	18.03	18.14	18.25	18.35
	FA	15.92	16.07	16.22	16.38	16.53	16.69	16.83	16.99	17.14	17.29	17.44	17.60	17.75	17.90	18.05	18.21	18.36	18.51	18.66	18.82
54	UA	15.96	16.06	16.17	16.28	16.38	16.49	16.59	16.70	16.81	16.91	17.02	17.12	17.23	17.34	17.45	17.55	17.66	17.76	17.87	17.98
	FA	15.73	15.88	16.03	16.19	16.34	16.49	16.64	16.80	16.95	17.10	17.25	17.41	17.56	17.71	17.86	18.02	18.17	18.32	18.47	18.63
53	UA	15.58	15.70	15.79	15.90	16.00	16.11	16.22	16.32	16.43	16.54	16.64	16.75	16.86	16.96	17.07	17.17	17.28	17.39	17.49	17.60
	FA	15.54	15.69	15.84	16.00	16.15	16.30	16.45	16.61	16.76	16.91	17.06	17.22	17.37	17.52	17.67	17.83	17.98	18.13	18.28	18.44
52	UA	15.20	15.31	15.42	15.52	15.63	15.73	15.84	15.95	16.05	16.16	16.27	16.37	16.48	16.59	16.69	16.80	16.90	17.01	17.12	17.22
	FA	15.35	15.50	15.65	15.80	15.96	16.11	16.26	16.42	16.57	16.72	16.87	17.03	17.18	17.33	17.48	17.64	17.79	17.94	18.09	18.25
51	UA	14.83	14.93	15.04	15.14	15.25	15.36	15.46	15.57	15.69	15.78	15.89	16.00	16.10	16.21	16.31	16.42	16.53	16.63	16.74	16.85
	FA	15.16	15.31	15.46	15.61	15.77	15.92	16.07	16.22	16.38	16.53	16.68	16.83	16.99	17.14	17.29	17.44	17.60	17.75	17.90	18.06
50	UA	14.45	14.56	14.66	14.77	14.87	14.98	15.09	15.19	15.30	15.41	15.51	15.62	15.73	15.83	15.94	16.04	16.15	16.26	16.36	16.47
	FA	14.97	15.12	15.27	15.42	15.58	15.73	15.88	16.03	16.19	16.34	16.49	16.64	16.80	16.95	17.10	17.25	17.41	17.56	17.71	17.86
49	UA	14.07	14.18	14.28	14.39	14.50	14.60	14.71	14.82	14.92	15.03	15.14	15.24	15.35	15.46	15.56	15.67	15.77	15.88	15.99	16.09
	FA	14.78	14.93	15.08	15.23	15.39	15.54	15.69	15.84	16.00	16.15	16.30	16.45	16.61	16.76	16.91	17.06	17.22	17.37	17.52	17.67
48	UA	13.70	13.80	13.91	14.01	14.12	14.23	14.33	14.44	14.55	14.65	14.76	14.87	14.97	15.08	15.18	15.29	15.40	15.50	15.61	15.72
	FA	14.58	14.74	14.89	15.04	15.19	15.35	15.50	15.65	15.81	15.96	16.11	16.26	16.42	16.57	16.72	16.87	17.03	17.18	17.33	17.48

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.038	.019
.2	.075	.038
.3	.113	.057
.4	.151	.076
.5	.188	.095
.6	.226	.114
.7	.264	.133
.8	.301	.152
.9	.339	.172

Table 118

Norms for Thigh and Calf of Seven-Year-Old Girls (Thigh = .6360 chest circumference + 1.9387 knee - 13.3581; calf = .3912 chest circumference + 1.2591 knee - 6.8741)

Chest Circumference, Centimeters		Knee Width, Centimeters													
		6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8
67	Th	41.27	41.66	42.05	42.44	42.82	43.21	43.60	43.99	44.38	44.76	45.15	45.54	45.93	46.31
	Ca	27.14	27.39	27.65	27.90	28.15	28.40	28.65	28.91	29.16	29.41	29.66	29.91	30.16	30.42
66	Th	40.64	41.03	41.41	41.80	42.19	42.58	42.96	43.35	43.74	44.13	44.52	44.90	45.29	45.68
	Ca	26.75	27.00	27.26	27.51	27.76	28.01	28.26	28.51	28.77	29.02	29.27	29.52	29.77	30.03
65	Th	40.00	40.39	40.78	41.17	41.55	41.94	42.33	42.72	43.10	43.49	43.88	44.27	44.65	45.04
	Ca	26.36	26.61	26.86	27.12	27.37	27.62	27.87	28.12	28.37	28.63	28.88	29.13	29.38	29.63
64	Th	39.37	39.75	40.14	40.53	40.92	41.30	41.69	42.08	42.47	42.86	43.24	43.63	44.02	44.41
	Ca	25.97	26.22	26.47	26.72	26.98	27.23	27.48	27.73	27.98	28.24	28.49	28.74	28.99	29.24
63	Th	38.73	39.12	39.51	39.89	40.28	40.67	41.06	41.44	41.83	42.22	42.61	42.99	43.38	43.77
	Ca	25.58	25.83	26.08	26.33	26.59	26.84	27.09	27.34	27.59	27.84	28.10	28.35	28.60	28.85
62	Th	38.09	38.48	38.87	39.26	39.64	40.03	40.42	40.81	41.20	41.58	41.97	42.36	42.75	43.13
	Ca	25.19	25.44	25.69	25.94	26.19	26.45	26.70	26.95	27.20	27.45	27.70	27.96	28.21	28.46
61	Th	37.46	37.85	38.23	38.62	39.01	39.40	39.78	40.17	40.56	40.95	41.34	41.72	42.11	42.50
	Ca	24.80	25.05	25.30	25.55	25.80	26.05	26.31	26.56	26.81	27.06	27.31	27.57	27.82	28.07
60	Th	36.82	37.21	37.60	37.99	38.37	38.76	39.15	39.54	39.92	40.31	40.70	41.09	41.47	41.86
	Ca	24.40	24.66	24.91	25.16	25.41	25.66	25.92	26.17	26.42	26.67	26.92	27.17	27.43	27.68
59	Th	36.19	36.57	36.96	37.35	37.74	38.12	38.51	38.90	39.29	39.68	40.06	40.45	40.84	41.23
	Ca	24.01	24.26	24.52	24.77	25.02	25.27	25.52	25.78	26.03	26.28	26.53	26.78	27.03	27.29
58	Th	35.55	35.94	36.33	36.71	37.10	37.49	37.88	38.26	38.65	39.04	39.43	39.81	40.20	40.59
	Ca	23.62	23.87	24.13	24.38	24.63	24.88	25.13	25.38	25.64	25.89	26.14	26.39	26.64	26.90
57	Th	34.91	35.30	35.69	36.08	36.46	36.85	37.24	37.63	38.02	38.40	38.79	39.18	39.57	39.95
	Ca	23.23	23.48	23.73	23.99	24.24	24.49	24.74	24.99	25.25	25.50	25.75	26.00	26.25	26.51
56	Th	34.28	34.67	35.05	35.44	35.83	36.22	36.60	36.99	37.38	37.77	38.16	38.54	38.93	39.32
	Ca	22.84	23.09	23.34	23.59	23.85	24.10	24.35	24.60	24.85	25.11	25.36	25.61	25.86	26.11
55	Th	33.64	34.03	34.42	34.81	35.19	35.58	35.97	36.36	36.74	37.13	37.52	37.91	38.29	38.68
	Ca	22.45	22.70	22.95	23.20	23.46	23.71	23.96	24.21	24.46	24.71	24.97	25.22	25.47	25.72
54	Th	33.01	33.39	33.78	34.17	34.56	34.94	35.33	35.72	36.11	36.50	36.88	37.27	37.66	38.05
	Ca	22.06	22.31	22.56	22.81	23.06	23.32	23.57	23.82	24.07	24.32	24.58	24.83	25.08	25.33
53	Th	32.37	32.76	33.15	33.53	33.92	34.31	34.70	35.08	35.47	35.86	36.25	36.63	37.02	37.41
	Ca	21.67	21.92	22.17	22.42	22.67	22.93	23.18	23.43	23.68	23.93	24.18	24.44	24.69	24.94
52	Th	31.73	32.12	32.51	32.90	33.28	33.67	34.06	34.45	34.84	35.22	35.61	36.00	36.39	36.77
	Ca	21.27	21.53	21.78	22.03	22.28	22.53	22.79	23.04	23.29	23.54	23.79	24.04	24.30	24.55
51	Th	31.10	31.49	31.87	32.26	32.65	33.04	33.42	33.81	34.20	34.59	34.98	35.36	35.75	36.14
	Ca	20.88	21.14	21.39	21.64	21.89	22.14	22.39	22.65	22.90	23.15	23.40	23.65	23.91	24.16
50	Th	30.46	30.85	31.24	31.63	32.01	32.40	32.79	33.18	33.56	33.95	34.34	34.73	35.11	35.50
	Ca	20.49	20.74	21.00	21.25	21.50	21.75	22.00	22.26	22.51	22.76	23.01	23.26	23.51	23.77
49	Th	29.83	30.21	30.60	30.99	31.38	31.76	32.15	32.54	32.93	33.32	33.70	34.09	34.48	34.87
	Ca	20.10	20.35	20.60	20.86	21.11	21.36	21.61	21.86	22.12	22.37	22.62	22.87	23.12	23.37
48	Th	29.19	29.58	29.97	30.35	30.74	31.13	31.52	31.90	32.29	32.68	33.07	33.45	33.84	34.23
	Ca	19.71	19.96	20.21	20.47	20.72	20.97	21.22	21.47	21.72	21.98	22.23	22.48	22.73	22.98

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.194	0	.126
.1	.064	.257	.039	.165
.2	.127	.321	.078	.204
.3	.191	.385	.117	.243
.4	.254	.448	.156	.282
.5	.318	.512	.196	.322
.6	.382	.575	.235	.361
.7	.445	.639	.274	.400
.8	.509	.703	.313	.439
.9	.572	.766	.352	.478

Table 119

Norms for Upper Arm and Forearm of Eight-Year-Old Girls (Upper arm = .2604 chest circumference + 1.8338 elbow - 5.8281; forearm = .1397 chest circumference + 2.0212 elbow - .2774)

Chest Circumference, Centimeters		Elbow Width, Centimeters																		
		4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0
69	UA	19.84	20.02	20.21	20.39	20.57	20.76	20.94	21.13	21.31	21.49	21.68	21.86	22.04	22.23	22.41	22.59	22.78	22.96	23.14
	FA	17.85	18.05	18.26	18.46	18.66	18.86	19.06	19.27	19.47	19.67	19.87	20.07	20.28	20.48	20.68	20.88	21.08	21.29	21.49
68	UA	19.58	19.76	19.94	20.13	20.31	20.50	20.68	20.86	21.05	21.23	21.41	21.60	21.78	21.97	22.15	22.33	22.52	22.70	22.88
	FA	17.71	17.91	18.12	18.32	18.52	18.72	18.92	19.13	19.33	19.53	19.73	19.93	20.14	20.34	20.54	20.74	20.95	21.15	21.35
67	UA	19.32	19.50	19.68	19.87	20.05	20.24	20.42	20.60	20.79	20.97	21.15	21.34	21.52	21.70	21.89	22.07	22.25	22.44	22.62
	FA	17.57	17.77	17.98	18.18	18.38	18.58	18.78	18.99	19.19	19.39	19.59	19.79	20.00	20.20	20.40	20.60	20.81	21.01	21.21
66	UA	19.06	19.24	19.43	19.61	19.79	19.98	20.16	20.35	20.53	20.71	20.89	21.08	21.26	21.44	21.63	21.81	21.99	22.17	22.36
	FA	17.43	17.63	17.84	18.04	18.24	18.44	18.64	18.85	19.05	19.25	19.45	19.66	19.86	20.06	20.26	20.46	20.67	20.87	21.07
65	UA	18.80	18.98	19.17	19.35	19.53	19.72	19.90	20.08	20.27	20.45	20.53	20.82	21.00	21.18	21.37	21.55	21.73	21.92	22.10
	FA	17.29	17.49	17.70	17.90	18.10	18.30	18.50	18.71	18.91	19.11	19.31	19.52	19.72	19.92	20.12	20.32	20.53	20.73	20.93
64	UA	18.54	18.72	18.91	19.09	19.27	19.46	19.64	19.82	20.01	20.19	20.37	20.56	20.74	20.92	21.10	21.29	21.47	21.66	21.84
	FA	17.15	17.35	17.56	17.76	17.96	18.16	18.37	18.57	18.77	18.97	19.17	19.38	19.58	19.78	19.98	20.18	20.39	20.59	20.79
63	UA	18.28	18.46	18.65	18.83	19.01	19.20	19.38	19.56	19.74	19.93	20.11	20.30	20.48	20.66	20.85	21.03	21.21	21.40	21.58
	FA	17.01	17.21	17.41	17.62	17.82	18.02	18.23	18.43	18.63	18.83	19.03	19.24	19.44	19.64	19.84	20.04	20.25	20.45	20.65
62	UA	18.02	18.20	18.39	18.57	18.75	18.94	19.12	19.30	19.49	19.67	19.85	20.04	20.22	20.40	20.59	20.76	20.95	21.14	21.32
	FA	16.87	17.08	17.28	17.48	17.68	17.88	18.09	18.29	18.49	18.69	18.89	19.10	19.30	19.50	19.70	19.90	20.11	20.31	20.51
61	UA	17.76	17.94	18.13	18.31	18.49	18.68	18.86	19.04	19.23	19.41	19.59	19.78	19.96	20.14	20.33	20.51	20.69	20.87	21.06
	FA	16.73	16.94	17.14	17.34	17.54	17.74	17.95	18.15	18.35	18.55	18.75	18.96	19.16	19.36	19.56	19.77	19.97	20.17	20.37
60	UA	17.50	17.68	17.86	18.05	18.23	18.41	18.60	18.78	18.96	19.15	19.33	19.52	19.70	19.88	20.07	20.25	20.43	20.62	20.80
	FA	16.59	17.80	17.00	17.20	17.40	17.60	17.81	18.01	18.21	18.41	18.61	18.82	19.02	19.22	19.42	19.63	19.83	20.03	20.23
59	UA	17.24	17.42	17.60	17.79	17.97	18.15	18.34	18.52	18.70	18.89	19.07	19.25	19.44	19.62	19.80	19.99	20.17	20.35	20.54
	FA	16.45	16.66	16.86	17.06	17.26	17.46	17.67	17.87	18.07	18.27	18.48	18.68	18.88	19.08	19.28	19.49	19.69	19.89	20.09
58	UA	16.98	17.16	17.34	17.53	17.71	17.89	18.08	18.26	18.44	18.63	18.81	18.99	19.18	19.36	19.54	19.73	19.91	20.09	20.28
	FA	16.31	16.52	16.72	16.92	17.12	17.32	17.53	17.73	17.93	18.13	18.34	18.54	18.74	18.94	19.14	19.35	19.55	19.75	19.95
57	UA	16.72	16.90	17.08	17.27	17.45	17.63	17.82	18.00	18.18	18.37	18.55	18.73	18.92	19.10	19.28	19.47	19.65	19.83	20.02
	FA	16.17	16.38	16.58	16.78	16.98	17.19	17.39	17.59	17.79	17.99	18.20	18.40	18.60	18.80	19.00	19.21	19.41	19.61	19.81
56	UA	16.46	16.64	16.82	17.01	17.19	17.37	17.56	17.74	17.92	18.11	18.29	18.47	18.66	18.84	19.02	19.21	19.39	19.57	19.76
55	UA	16.20	16.38	16.56	16.75	16.92	17.11	17.30	17.48	17.66	17.85	18.03	18.21	18.40	18.58	18.76	18.95	19.13	19.31	19.50
	FA	15.90	16.10	16.30	16.50	16.70	16.91	17.11	17.31	17.51	17.71	17.92	18.12	18.32	18.52	18.72	18.93	19.13	19.33	19.53
54	UA	15.94	16.12	16.30	16.49	16.67	16.85	17.04	17.22	17.40	17.59	17.77	17.95	18.14	18.32	18.50	18.69	18.87	19.05	19.24
	FA	15.76	15.96	16.16	16.36	16.56	16.77	16.97	17.17	17.37	17.57	17.78	17.98	18.18	18.38	18.59	18.79	18.99	19.19	19.39
53	UA	15.68	15.86	16.04	16.23	16.41	16.59	16.78	16.96	17.14	17.33	17.51	17.69	17.88	18.06	18.24	18.43	18.61	18.79	18.98
	FA	15.62	15.82	16.02	16.22	16.42	16.63	16.83	17.03	17.23	17.43	17.64	17.84	18.04	18.24	18.45	18.65	18.85	19.05	19.25
52	UA	15.41	15.60	15.78	15.96	16.15	16.33	16.51	16.70	16.88	17.07	17.25	17.43	17.62	17.80	17.98	18.17	18.35	18.53	18.72
	FA	15.48	15.68	15.88	16.08	16.28	16.49	16.69	16.89	17.09	17.30	17.50	17.70	17.90	18.10	18.31	18.51	18.71	18.91	19.11
51	UA	15.15	15.34	15.52	15.70	15.89	16.07	16.25	16.44	16.62	16.80	16.99	17.17	17.36	17.54	17.72	17.90	18.09	18.27	18.46
	FA	15.34	15.54	15.74	15.94	16.14	16.35	16.55	16.75	16.95	17.16	17.36	17.56	17.76	17.96	18.17	18.37	18.57	18.77	18.97
50	UA	14.89	15.08	15.26	15.44	15.63	15.81	15.99	16.08	16.36	16.54	16.73	16.91	17.09	17.28	17.46	17.64	17.83	18.01	18.19
	FA	15.20	15.40	15.60	15.80	16.01	16.21	16.41	16.61	16.81	17.02	17.22	17.42	17.62	17.82	18.03	18.23	18.43	18.63	18.83
49	UA	14.63	14.82	15.00	15.18	15.37	15.55	15.73	15.92	16.10	16.28	16.47	16.65	16.83	17.02	17.20	17.38	17.57	17.75	17.93
	FA	15.06	15.26	15.46	15.66	15.87	16.07	16.27	16.47	16.67	16.88	17.08	17.28	17.48	17.68	17.89	18.09	18.29	18.49	18.70
48	UA	14.37	14.56	14.74	14.92	15.11	15.29	15.47	15.66	15.84	16.02	16.21	16.39	16.57	16.76	16.94	17.12	17.31	17.49	17.67
	FA	14.92	15.12	15.32	15.52	15.73	15.93	16.13	16.33	16.53	16.74	16.94	17.14	17.34	17.54	17.75	17.95	18.15	18.35	18.56

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.026	.014
.2	.052	.028
.3	.078	.042
.4	.104	.056
.5	.130	.070
.6	.156	.084
.7	.182	.098
.8	.208	.112
.9	.234	.126

Table 120

Norms for Thigh and Calf of Eight-Year-Old Girls (Thigh = .6425 chest circumference + 2.1831 knee - 15.4796; calf = .3220 chest circumference + 1.2772 knee - 2.8631)

Chest Circumference, Centimeters		Knee Width, Centimeters																
		6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4
69	Th	42.39	42.82	43.26	43.70	44.13	44.57	45.01	45.44	45.88	46.32	46.75	47.19	47.63	48.06	48.50	48.94	49.37
	Ca	27.27	27.53	27.78	28.04	28.30	28.55	28.81	29.06	29.32	29.57	29.83	30.08	30.34	30.59	30.85	31.11	31.36
68	Th	41.75	42.18	42.62	43.06	43.49	43.93	44.37	44.80	45.24	45.68	46.11	46.55	46.99	47.42	47.86	48.29	48.73
	Ca	26.95	27.21	27.46	27.72	27.97	28.23	28.48	28.74	29.00	29.25	29.51	29.76	30.02	30.27	30.53	30.78	31.04
67	Th	41.10	41.54	41.98	42.41	42.85	43.29	43.72	44.16	44.60	45.03	45.47	45.91	46.34	46.78	47.22	47.65	48.09
	Ca	26.69	26.88	27.14	27.40	27.65	27.91	28.16	28.42	28.67	28.93	29.18	29.44	29.69	29.95	30.21	30.46	30.72
66	Th	40.46	40.90	41.33	41.77	42.21	42.64	43.08	43.52	43.95	44.39	44.83	45.26	45.70	46.14	46.57	47.01	47.45
	Ca	26.31	26.56	26.82	27.07	27.33	27.58	27.84	28.10	28.35	28.61	28.86	29.12	29.37	29.63	29.88	30.14	30.39
65	Th	39.82	40.25	40.69	41.13	41.56	42.00	42.44	42.87	43.31	43.75	44.18	44.62	45.06	45.49	45.93	46.37	46.80
	Ca	25.99	26.24	26.50	26.75	27.01	27.26	27.52	27.77	28.03	28.28	28.54	28.80	29.05	29.31	29.56	29.82	30.07
64	Th	39.18	39.61	40.05	40.49	40.92	41.36	41.80	42.23	42.67	43.11	43.54	43.98	44.42	44.85	45.29	45.72	46.16
	Ca	25.66	25.92	26.17	26.43	26.69	26.94	27.20	27.45	27.71	27.96	28.22	28.47	28.73	28.98	29.24	29.50	29.75
63	Th	38.53	38.97	39.41	39.84	40.28	40.72	41.15	41.59	42.03	42.46	42.90	43.34	43.77	44.21	44.65	45.08	45.52
	Ca	25.34	25.60	25.85	26.11	26.36	26.62	26.87	27.13	27.39	27.64	27.90	28.15	28.41	28.66	28.92	29.17	29.43
62	Th	37.89	38.33	38.76	39.20	39.64	40.07	40.51	40.95	41.38	41.82	42.26	42.69	43.13	43.57	44.00	44.44	44.88
	Ca	25.02	25.27	25.53	25.79	26.04	26.30	26.55	26.81	27.06	27.32	27.57	27.83	28.08	28.34	28.60	28.85	29.11
61	Th	37.25	37.68	38.12	38.56	38.99	39.43	39.87	40.30	40.74	41.18	41.61	42.05	42.49	42.92	43.36	43.80	44.23
	Ca	24.70	24.95	25.20	25.46	25.72	25.97	26.23	26.49	26.74	27.00	27.25	27.51	27.76	28.02	28.27	28.53	28.78
60	Th	36.61	37.04	37.48	37.92	38.35	38.79	39.23	39.66	40.10	40.54	40.97	41.41	41.85	42.28	42.72	43.15	43.59
	Ca	24.38	24.63	24.89	25.14	25.40	25.65	25.91	26.16	26.42	26.67	26.93	27.19	27.44	27.70	27.95	28.21	28.46
59	Th	35.96	36.40	36.84	37.27	37.71	38.15	38.58	39.02	39.46	39.89	40.33	40.77	41.20	41.64	42.08	42.51	42.95
	Ca	24.05	24.31	24.56	24.82	25.08	25.33	25.59	25.84	26.10	26.35	26.61	26.86	27.12	27.37	27.63	27.89	28.14
58	Th	35.32	35.76	36.19	36.63	37.07	37.50	37.94	38.38	38.81	39.25	39.69	40.12	40.56	41.00	41.43	41.86	42.31
	Ca	23.73	23.99	24.24	24.50	24.75	25.01	25.26	25.52	25.78	26.03	26.29	26.54	26.80	27.05	27.31	27.56	27.82
57	Th	34.68	35.11	35.55	35.99	36.42	36.86	37.30	37.73	38.17	38.61	39.04	39.48	39.92	40.35	40.79	41.23	41.66
	Ca	23.41	23.66	23.92	24.18	24.43	24.69	24.94	25.20	25.45	25.71	25.96	26.22	26.47	26.73	26.99	27.24	27.50
56	Th	34.04	34.47	34.90	35.35	35.78	36.22	36.66	37.09	37.53	37.97	38.40	38.84	39.28	39.71	40.15	40.58	41.02
	Ca	23.09	23.34	23.60	23.85	24.11	24.36	24.62	24.88	25.13	25.39	25.64	25.90	26.15	26.41	26.66	26.92	27.17
55	Th	33.39	33.83	34.27	34.70	35.14	35.78	36.01	36.45	36.89	37.32	37.76	38.20	38.63	39.07	39.51	39.94	40.38
	Ca	22.77	23.02	23.28	23.53	23.79	24.04	24.30	24.55	24.81	25.06	25.32	25.58	25.83	26.09	26.34	26.60	26.85
54	Th	32.75	33.19	33.62	34.06	34.50	34.93	35.37	35.81	36.24	36.68	37.12	37.55	37.99	38.43	38.86	39.30	39.74
	Ca	22.44	22.70	22.95	23.21	23.46	23.72	23.98	24.23	24.49	24.74	25.00	25.25	25.51	25.76	26.02	26.28	26.53
53	Th	32.11	32.54	32.98	33.42	33.85	34.29	34.73	35.16	35.60	36.04	36.47	36.91	37.35	37.78	38.22	38.65	39.09
	Ca	22.12	22.38	22.63	22.89	23.14	23.40	23.65	23.91	24.17	24.42	24.68	24.93	25.19	25.44	25.70	25.95	26.21
52	Th	31.46	31.90	32.34	32.78	33.21	33.65	34.09	34.52	34.96	35.40	35.83	36.27	36.71	37.14	37.58	38.01	38.45
	Ca	21.80	22.05	22.31	22.57	22.82	23.08	23.33	23.59	23.84	24.10	24.35	24.61	24.86	25.12	25.38	25.63	25.89
51	Th	30.82	31.26	31.70	32.13	32.57	33.01	33.44	33.88	34.32	34.75	35.19	35.63	36.06	36.50	36.94	37.37	37.81
	Ca	21.48	21.73	21.99	22.24	22.50	22.75	23.01	23.27	23.52	23.78	24.03	24.29	24.54	24.80	25.05	25.31	25.56
50	Th	30.18	30.62	31.05	31.49	31.93	32.36	32.80	33.24	33.67	34.11	34.55	34.98	35.42	35.86	36.29	36.73	37.17
	Ca	21.16	21.41	21.67	21.92	22.18	22.43	22.69	22.94	23.20	23.45	23.71	23.97	24.22	24.48	24.73	24.99	25.24
49	Th	29.54	29.97	30.41	30.85	31.28	31.72	32.16	32.59	33.03	33.47	33.90	34.34	34.78	35.21	35.65	36.09	36.52
	Ca	20.83	21.09	21.34	21.60	21.86	22.11	22.37	22.62	22.88	23.13	23.38	23.64	23.90	24.15	24.41	24.67	24.92
48	Th	28.90	29.33	29.77	30.21	30.64	31.08	31.52	31.95	32.39	32.83	33.26	33.70	34.14	34.57	35.01	35.44	35.88
	Ca	20.51	20.77	21.02	21.28	21.53	21.79	22.04	22.30	22.56	22.81	23.07	23.32	23.58	23.83	24.09	24.34	24.60

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.218	0	.128
.1	.064	.282	.032	.160
.2	.129	.347	.064	.192
.3	.193	.411	.097	.224
.4	.257	.475	.129	.256
.5	.321	.540	.161	.289
.6	.386	.604	.193	.321
.7	.450	.668	.225	.353
.8	.514	.732	.258	.385
.9	.578	.797	.290	.418

Table 121

Norms for Upper Arm and Forearm of Nine-Year-Old Girls (Upper arm = .4517 chest circumference + .7654 elbow - 11.9656; forearm = .2314 chest circumference + 1.1510 elbow - 1.4205)

Chest Circumference, Centimeters		Elbow Width, Centimeters																				
		4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2
71	UA	23.32	23.40	23.47	23.55	23.63	23.70	23.78	23.86	23.93	24.01	24.09	24.16	24.24	24.31	24.39	24.47	24.54	24.62	24.70	24.77	24.85
	FA	19.84	19.96	20.07	20.19	20.30	20.42	20.53	20.65	20.76	20.88	20.99	21.11	21.22	21.34	21.45	21.57	21.68	21.80	21.91	22.03	22.15
70	UA	22.87	22.94	23.02	23.10	23.17	23.25	23.33	23.40	23.48	23.56	23.63	23.71	23.79	23.86	23.94	24.02	24.09	24.17	24.25	24.32	24.40
	FA	19.61	19.73	19.84	19.96	20.07	20.19	20.30	20.42	20.53	20.65	20.76	20.88	20.99	21.11	21.22	21.34	21.45	21.57	21.68	21.80	21.91
69	UA	22.42	22.49	22.57	22.65	22.72	22.80	22.88	22.95	23.03	23.11	23.18	23.26	23.33	23.41	23.49	23.56	23.64	23.72	23.79	23.87	23.95
	FA	19.38	19.50	19.61	19.73	19.84	19.96	20.07	20.19	20.30	20.42	20.53	20.65	20.76	20.88	20.99	21.11	21.22	21.34	21.45	21.57	21.68
68	UA	21.96	22.04	22.12	22.19	22.27	22.35	22.42	22.50	22.58	22.65	22.73	22.81	22.89	22.96	23.04	23.11	23.19	23.27	23.34	23.42	23.50
	FA	19.15	19.26	19.38	19.49	19.61	19.73	19.84	19.95	20.07	20.18	20.30	20.42	20.53	20.65	20.76	20.88	20.99	21.11	21.22	21.34	21.45
67	UA	21.51	21.59	21.67	21.74	21.82	21.90	21.97	22.05	22.13	22.20	22.28	22.35	22.43	22.51	22.58	22.66	22.74	22.81	22.89	22.97	23.04
	FA	18.92	19.03	19.15	19.26	19.38	19.49	19.61	19.72	19.84	19.95	20.07	20.18	20.30	20.41	20.53	20.64	20.76	20.87	20.99	21.11	21.22
66	UA	21.06	21.14	21.21	21.29	21.37	21.44	21.52	21.60	21.67	21.75	21.83	21.90	21.97	22.05	22.13	22.21	22.29	22.36	22.49	22.52	22.59
	FA	18.69	18.80	18.92	19.03	19.15	19.26	19.38	19.49	19.61	19.72	19.84	19.95	20.07	20.18	20.30	20.41	20.53	20.64	20.76	20.87	20.99
65	UA	20.61	20.69	20.76	20.84	20.92	20.99	21.07	21.15	21.22	21.30	21.37	21.45	21.53	21.60	21.68	21.76	21.33	21.91	21.99	22.06	22.14
	FA	18.45	18.57	18.68	18.80	18.92	19.03	19.15	19.26	19.38	19.49	19.61	19.72	19.84	19.95	20.07	20.18	20.30	20.41	20.53	20.64	20.76
64	UA	20.16	20.23	20.31	20.39	20.46	20.54	20.62	20.69	20.77	20.85	20.92	21.00	21.08	21.15	21.23	21.31	21.38	21.46	21.54	21.61	21.69
	FA	18.22	18.34	18.45	18.57	18.68	18.80	18.91	19.03	19.14	19.26	19.37	19.49	19.60	19.72	19.83	19.95	20.06	20.18	20.30	20.41	20.53
63	UA	19.71	19.78	19.86	19.94	20.01	20.09	20.17	20.24	20.32	20.40	20.47	20.55	20.62	20.70	20.78	20.85	20.93	21.01	21.08	21.16	21.24
	FA	17.99	18.11	18.22	18.34	18.45	18.57	18.68	18.80	18.91	19.03	19.14	19.26	19.37	19.49	19.60	19.72	19.83	19.95	20.06	20.18	20.29
62	UA	19.25	19.33	19.41	19.48	19.56	19.64	19.71	19.79	19.87	19.94	20.02	20.10	21.17	20.25	20.33	20.40	20.48	20.56	20.63	20.71	20.79
	FA	17.76	17.88	17.99	18.11	18.22	18.34	18.45	18.57	18.68	18.80	18.91	19.03	19.14	19.26	19.37	19.49	19.60	19.72	19.83	19.95	20.06
61	UA	18.80	18.88	18.96	19.03	19.11	19.19	19.26	19.34	19.42	19.49	19.57	19.64	19.72	19.80	19.87	19.95	20.03	20.10	20.18	20.26	20.33
	FA	17.53	17.64	17.76	17.87	17.99	18.10	18.22	18.33	18.45	18.57	18.68	18.80	18.91	19.03	19.14	19.26	19.37	19.49	19.60	19.72	19.83
60	UA	18.35	18.43	18.50	18.58	18.66	18.73	18.81	18.89	18.96	19.04	19.12	19.19	19.27	19.35	19.42	19.50	19.58	19.65	19.73	19.81	19.88
	FA	17.30	17.41	17.53	17.64	17.76	17.87	17.99	18.10	18.22	18.33	18.45	18.56	18.68	18.79	18.91	19.02	19.14	19.25	19.37	19.48	19.60
59	UA	17.90	17.98	18.05	18.13	18.21	18.28	18.36	18.44	18.51	18.59	18.66	18.74	18.82	18.89	18.97	19.05	19.12	19.20	19.28	19.35	19.43
	FA	17.07	17.18	17.30	17.41	17.53	17.64	17.76	17.87	17.99	18.10	18.22	18.33	18.45	18.56	18.68	18.79	18.91	19.02	19.14	19.25	19.37
58	UA	17.45	17.52	17.60	17.68	17.75	17.83	17.91	17.98	18.06	18.14	18.21	18.29	18.37	18.44	18.52	18.60	18.67	18.75	18.83	18.90	18.98
	FA	16.83	16.95	17.07	17.18	17.30	17.41	17.53	17.64	17.76	17.87	17.99	18.10	18.22	18.33	18.45	18.56	18.68	18.79	18.91	19.02	19.14
57	UA	17.00	17.07	17.15	17.23	17.30	17.38	17.46	17.53	17.61	17.68	17.76	17.84	17.91	17.99	18.07	18.14	18.22	18.30	18.37	18.45	18.53
	FA	16.60	16.72	16.83	16.95	17.06	17.18	17.29	17.41	17.52	17.64	17.75	17.87	17.98	18.10	18.21	18.33	18.45	18.56	18.68	18.79	18.91
56	UA	16.54	16.62	16.70	16.77	16.85	16.93	17.00	17.08	17.16	17.23	17.31	17.39	17.46	17.54	17.62	17.69	17.77	17.85	17.92	18.00	18.08
	FA	16.37	16.49	16.60	16.72	16.83	16.95	17.06	17.18	17.29	17.41	17.52	17.64	17.75	17.87	17.98	18.10	18.21	18.33	18.44	18.56	18.67
55	UA	16.09	16.17	16.25	16.32	16.40	16.48	16.55	16.63	16.70	16.78	16.86	16.93	17.01	17.09	17.16	17.24	17.32	17.39	17.47	17.55	17.62
	FA	16.14	16.26	16.37	16.49	16.60	16.72	16.83	16.95	17.06	17.18	17.29	17.41	17.52	17.64	17.75	17.87	17.98	18.10	18.21	18.33	18.44
54	UA	15.64	15.72	15.79	15.87	15.95	16.02	16.10	16.18	16.25	16.33	16.41	16.48	16.56	16.64	16.71	16.79	16.87	16.94	17.02	17.10	17.17
	FA	15.91	16.02	16.14	16.25	16.37	16.48	16.60	16.72	16.82	16.95	17.06	17.18	17.29	17.41	17.52	17.64	17.75	17.87	17.98	18.10	18.21
53	UA	15.19	15.27	15.34	15.42	15.50	15.57	15.65	15.72	15.80	15.88	15.95	16.03	16.11	16.18	16.26	16.34	16.41	16.49	16.57	16.64	16.72
	FA	15.68	15.79	15.91	16.02	16.14	16.25	16.37	16.49	16.60	16.71	16.83	16.94	17.06	17.17	17.29	17.40	17.52	17.63	17.75	17.86	17.98
52	UA	14.74	14.81	14.89	14.97	15.04	15.12	15.20	15.27	15.35	15.43	15.50	15.59	15.66	15.73	15.81	15.89	15.96	16.04	16.12	16.19	16.27
	FA	15.45	15.56	15.68	15.79	15.91	16.02	16.14	16.25	16.37	16.49	16.60	16.71	16.83	16.94	17.06	17.17	17.29	17.40	17.52	17.63	17.75
51	UA	14.29	14.36	14.44	14.52	14.59	14.67	14.75	14.82	14.90	14.97	15.05	15.13	15.20	15.28	15.36	15.43	15.51	15.59	15.66	15.74	15.82
	FA	15.22	15.33	15.45	15.56	15.68	15.79	15.91	16.02	16.14	16.25	16.37	16.48	16.60	16.71	16.83	16.94	17.06	17.17	17.29	17.40	17.52
50	UA	13.83	13.91	13.99	14.06	14.14	14.22	14.29	14.37	14.45	14.52	14.60	14.68	14.75	14.83	14.91	14.98	15.06	15.14	15.21	15.29	15.36
	FA	14.98	15.10	15.21	15.33	15.44	15.56	15.67	15.79	15.90	16.01	16.13	16.25	16.36	16.48	16.60	16.71	16.83	16.94	17.06	17.17	17.29
49	UA	13.38	13.46	13.54	13.61	13.69	13.77	13.84	13.92	13.99	14.07	14.15	14.22	14.30	14.38	14.45	14.53	14.60	14.68	14.76	14.83	14.91
	FA	14.75	14.87	14.98	15.10	15.21	15.33	15.44	15.56	15.67	15.79	15.90	16.02	16.13	16.25	16.36	16.48	16.59	16.71	16.82	16.94	17.05

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.045	.023
.2	.090	.046
.3	.136	.069
.4	.181	.093
.5	.226	.116
.6	.271	.139
.7	.316	.162
.8	.361	.185
.9	.407	.208

Table 122

Norms for Thigh and Calf of Nine-Year-Old Girls (Thigh = .7113 chest circumference + 1.8910 knee - 17.8412; calf = .4087 chest circumference + 1.1133 knee - 6.7800)

Chest Circumference, Centimeters		Knee Width, Centimeters														
		6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4
71	Th	45.14	45.52	45.90	46.28	46.65	47.03	47.41	47.79	48.17	48.55	48.92	49.30	49.68	50.06	50.44
	Ca	29.59	29.80	30.03	30.25	30.48	30.70	30.92	31.14	31.37	31.59	31.81	32.03	32.26	32.48	32.70
70	Th	44.43	44.81	45.19	45.57	45.94	46.32	46.70	47.08	47.46	47.83	48.21	48.59	48.97	49.35	49.73
	Ca	29.18	29.40	29.62	29.84	30.07	30.29	30.51	30.74	30.96	31.18	31.40	31.63	31.85	32.07	32.29
69	Th	43.72	44.10	44.48	44.85	45.23	45.61	45.99	46.37	46.74	47.12	47.50	47.88	48.26	48.64	49.01
	Ca	28.77	28.99	29.21	29.44	29.66	29.88	30.10	30.33	30.55	30.77	30.99	31.22	31.44	31.66	31.89
68	Th	43.01	43.39	43.76	44.14	44.52	44.90	45.28	45.66	46.03	46.41	46.79	47.17	47.55	47.92	48.30
	Ca	28.36	28.58	28.80	29.03	29.25	29.47	29.70	29.92	30.14	30.36	30.59	30.81	31.03	31.25	31.48
67	Th	42.30	42.67	43.05	43.43	43.81	44.19	44.56	44.94	45.32	45.70	46.08	46.46	46.83	47.21	47.59
	Ca	27.95	28.17	28.40	28.62	28.84	29.06	29.29	29.51	29.73	29.95	30.18	30.40	30.62	30.85	31.07
66	Th	41.59	41.96	42.34	42.72	43.10	43.48	43.85	44.23	44.61	44.99	45.37	45.75	46.12	46.50	46.88
	Ca	27.54	27.76	27.99	28.21	28.43	28.66	28.88	29.10	29.32	29.55	29.77	29.99	30.21	30.44	30.66
65	Th	40.87	41.25	41.63	42.01	42.39	42.76	43.14	43.52	43.90	44.28	44.66	45.03	45.41	45.79	46.17
	Ca	27.13	27.36	27.58	27.80	28.02	28.25	28.47	28.69	28.91	29.14	29.36	29.58	29.81	30.03	30.25
64	Th	40.16	40.54	40.92	41.30	41.68	42.05	42.43	42.81	43.19	43.57	43.94	44.32	44.70	45.07	45.46
	Ca	26.72	26.95	27.17	27.39	27.62	27.84	28.06	28.28	28.51	28.73	28.95	29.17	29.40	29.62	29.84
63	Th	39.45	39.83	40.21	40.59	40.96	41.34	41.72	42.10	42.48	42.86	43.23	43.61	43.99	44.36	44.75
	Ca	26.32	26.54	26.76	26.98	27.21	27.43	27.65	27.87	28.10	28.32	28.54	28.77	28.99	29.21	29.43
62	Th	38.74	39.11	39.50	39.87	40.25	40.63	41.01	41.39	41.77	42.14	42.52	42.90	43.28	43.66	44.03
	Ca	25.91	26.13	26.35	26.58	26.80	27.02	27.24	27.47	27.69	27.91	28.13	28.36	28.58	28.80	29.02
61	Th	38.03	38.41	38.79	39.16	39.54	39.92	40.30	40.68	41.05	41.43	41.81	42.19	42.57	42.95	43.32
	Ca	25.50	25.72	25.94	26.17	26.39	26.61	26.83	27.06	27.28	27.50	27.73	27.95	28.17	28.39	28.62
60	Th	37.32	37.70	38.07	38.45	38.83	39.21	39.59	39.96	40.34	40.72	41.10	41.48	41.86	42.23	42.61
	Ca	25.09	25.31	25.53	25.76	25.98	26.20	26.43	26.65	26.87	27.09	27.32	27.54	27.76	27.98	28.21
59	Th	36.61	36.98	37.36	37.74	38.12	38.50	38.88	39.25	39.63	40.01	40.39	40.77	41.14	41.52	41.90
	Ca	24.68	24.90	25.13	25.35	25.57	25.79	26.02	26.24	26.46	26.59	26.91	27.13	27.35	27.58	27.30
58	Th	35.89	36.27	36.65	37.03	37.41	37.79	38.16	38.54	38.92	39.30	39.68	40.06	40.43	40.81	41.19
	Ca	24.27	24.50	24.72	24.94	25.16	25.39	25.61	25.83	26.05	26.28	26.50	26.72	26.94	27.17	27.39
57	Th	35.18	35.56	35.94	36.32	36.70	37.07	37.45	37.83	38.21	38.59	38.97	39.34	39.72	40.10	40.48
	Ca	23.86	24.09	24.31	24.53	24.75	24.98	25.20	25.42	25.65	25.87	26.09	26.31	26.54	26.76	26.98
56	Th	34.47	34.85	35.23	35.61	35.99	36.36	36.74	37.12	37.50	37.88	38.25	38.63	39.01	39.39	39.77
	Ca	23.46	23.68	23.90	24.12	24.35	24.57	24.79	25.01	25.24	25.46	25.68	25.90	26.13	26.35	26.57
55	Th	33.76	34.14	34.52	34.90	35.27	35.65	36.03	36.41	36.79	37.16	37.54	37.92	38.30	38.68	39.06
	Ca	23.05	23.27	23.49	23.71	23.94	24.16	24.38	24.61	24.83	25.05	25.27	25.50	25.72	25.94	26.16
54	Th	33.05	33.43	33.81	34.18	34.56	34.94	35.32	35.70	36.08	36.45	36.83	37.21	37.59	37.97	38.34
	Ca	22.64	22.86	23.08	23.31	23.53	23.75	23.97	24.20	24.42	24.64	24.86	25.09	25.31	25.53	25.76
53	Th	32.34	32.72	33.09	33.47	33.85	34.23	34.61	34.99	35.36	35.74	36.12	36.50	36.88	37.25	37.63
	Ca	22.23	22.45	22.67	22.90	23.12	23.34	23.57	23.79	24.01	24.23	24.46	24.68	24.90	25.12	25.35
52	Th	31.63	32.01	32.38	32.76	33.14	33.52	33.90	34.27	34.65	35.03	35.41	35.79	36.17	36.54	36.92
	Ca	21.32	22.04	22.27	22.49	22.71	22.93	23.16	23.38	23.60	23.82	24.05	24.27	24.49	24.72	24.94
51	Th	30.92	31.29	31.67	32.05	32.43	32.81	33.18	33.56	33.94	34.32	34.70	35.08	35.45	35.83	36.21
	Ca	81.41	21.63	21.86	22.08	22.30	22.53	22.75	22.97	23.19	23.42	23.63	23.86	24.08	24.30	24.53
50	Th	30.20	30.58	30.96	31.34	31.72	32.10	32.47	32.85	33.23	33.61	33.99	34.36	34.74	35.12	35.50
	Ca	21.00	21.23	21.45	21.67	21.89	22.12	22.34	22.56	22.78	23.01	23.23	23.45	23.68	23.90	24.12
49	Th	29.49	29.87	30.25	30.63	31.01	31.38	31.76	32.14	32.52	32.90	33.28	33.65	34.03	34.41	34.79
	Ca	20.59	20.82	21.04	21.26	21.48	21.72	21.93	22.15	22.38	22.60	22.82	23.04	23.27	23.49	23.71

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.189	0	.111
.1	.071	.260	.041	.152
.2	.142	.331	.082	.193
.3	.213	.402	.123	.234
.4	.285	.474	.163	.275
.5	.356	.545	.204	.316
.6	.427	.616	.245	.357
.7	.498	.687	.286	.397
.8	.569	.758	.327	.438
.9	.640	.829	.368	.479

Table 123

Norms for Upper Arm and Forearm of Ten-Year-Old Girls (Upper arm = .4207 chest circumference + .4133 elbow - 8.1092; forearm = .2421 chest circumference + 1.1107 elbow - 1.8226)

Chest Circumference, Centimeters		Elbow Width, Centimeters																				
		4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4
73	UA	24.42	24.46	24.50	24.54	24.59	24.63	24.67	24.71	24.75	24.79	24.83	24.88	24.92	24.96	25.00	25.04	25.08	25.12	25.16	25.21	25.25
	FA	20.74	20.85	20.96	21.07	21.18	21.29	21.40	21.52	21.63	21.74	21.85	21.96	22.07	22.17	22.29	22.40	22.51	22.63	22.74	22.85	22.96
72	UA	24.00	24.04	24.08	24.12	24.17	24.21	24.25	24.29	24.33	24.37	24.41	24.45	24.50	25.54	24.58	24.62	24.66	24.70	24.74	24.78	24.83
	FA	20.50	20.61	20.72	20.83	20.94	21.05	21.16	21.27	21.38	21.50	21.61	21.72	21.83	21.94	22.05	22.16	22.27	22.38	22.49	22.61	22.72
71	UA	23.58	23.62	23.66	23.70	23.74	23.79	23.83	23.87	23.91	23.95	24.00	24.03	24.07	24.12	24.16	24.20	24.24	24.28	24.32	24.36	24.41
	FA	20.25	20.36	20.48	20.59	20.70	20.81	20.92	21.03	21.14	21.25	21.36	21.48	21.59	21.70	21.81	21.92	22.03	22.14	22.25	22.36	22.48
70	UA	23.16	23.20	23.24	23.28	23.32	23.36	23.41	23.45	23.49	23.53	23.57	23.61	23.65	23.70	23.74	23.78	23.82	23.86	23.90	23.94	23.98
	FA	20.01	20.12	20.23	20.34	20.46	20.57	20.68	20.79	20.90	21.01	21.12	21.23	21.34	21.46	21.57	21.68	21.79	21.90	22.01	22.12	22.23
69	UA	22.74	22.78	22.82	22.86	22.90	22.94	22.99	23.03	23.07	23.11	23.15	23.19	23.23	23.27	23.32	23.36	23.40	23.44	23.48	23.52	23.56
	FA	19.77	19.88	19.99	20.10	20.21	20.32	20.44	20.55	20.66	20.77	20.88	20.99	21.10	21.21	21.32	21.44	21.55	21.66	21.77	21.88	21.99
68	UA	22.32	22.36	22.40	22.44	22.48	22.52	22.56	22.61	22.65	22.69	22.73	22.77	22.81	22.85	22.90	22.94	22.98	23.02	23.06	23.10	23.14
	FA	19.53	19.64	19.75	19.86	19.97	20.08	20.19	20.30	20.42	20.53	20.64	20.75	20.86	20.92	21.08	21.19	21.30	21.42	21.53	21.64	21.75
67	UA	21.90	21.94	21.98	22.02	22.06	22.10	22.14	22.19	22.23	22.27	22.31	22.35	22.39	22.43	22.47	22.52	22.56	22.60	22.64	22.68	22.72
	FA	19.29	19.40	19.51	19.62	19.73	19.84	19.95	20.06	20.17	20.28	20.40	20.51	20.62	20.73	20.84	20.95	21.06	21.17	21.28	21.40	21.51
66	UA	21.48	21.52	21.56	21.60	21.64	21.68	21.72	21.76	21.81	21.85	21.89	21.93	21.97	22.01	22.05	22.10	22.14	22.18	22.22	22.26	22.30
	FA	19.04	19.15	19.27	19.38	19.49	19.60	19.71	19.82	19.93	20.04	20.15	20.26	20.38	20.49	20.60	20.71	20.82	20.93	21.04	21.15	21.26
65	UA	21.05	21.10	21.14	21.18	21.22	21.26	21.30	21.34	21.39	21.43	21.47	21.51	21.55	21.59	21.63	21.67	21.72	21.76	21.80	21.84	21.88
	FA	18.80	18.91	19.02	19.13	19.25	19.36	19.47	19.58	19.69	19.80	19.91	20.02	20.13	20.24	20.36	20.47	20.58	20.69	20.80	20.91	21.02
64	UA	20.63	20.68	20.72	20.76	20.80	20.84	20.88	20.92	20.96	21.01	21.05	21.09	21.13	21.17	21.21	21.25	21.30	21.34	21.38	21.42	21.46
	FA	18.56	18.67	18.78	18.89	19.00	19.11	19.23	19.34	19.45	19.56	19.67	19.78	19.89	20.00	20.11	20.22	20.34	20.45	20.56	20.67	20.78
63	UA	20.21	20.25	20.30	20.34	20.38	20.42	20.46	20.50	20.54	20.59	20.63	20.67	20.71	20.75	20.79	20.83	20.87	20.92	20.96	21.00	21.04
	FA	18.32	18.43	18.54	18.65	18.76	18.87	18.98	19.09	19.21	19.32	19.43	19.54	19.65	19.76	19.87	19.98	20.09	20.20	20.32	20.43	20.54
62	UA	19.79	19.83	19.88	19.92	19.96	20.00	20.04	20.08	20.12	20.16	20.21	20.25	20.29	20.33	20.37	20.41	20.45	20.50	20.54	20.58	20.62
	FA	18.07	18.19	18.30	18.41	18.52	18.63	18.74	18.85	18.96	19.07	19.19	19.30	19.41	19.52	19.63	19.74	19.85	19.96	20.07	20.19	20.30
61	UA	19.37	19.41	19.45	19.50	19.54	19.58	19.62	19.66	19.70	19.74	19.79	19.83	19.87	19.91	19.95	19.99	20.03	20.07	20.12	20.16	20.20
	FA	17.83	17.94	18.05	18.17	18.28	18.39	18.50	18.61	18.72	18.83	18.94	19.05	19.17	19.28	19.39	19.50	19.61	19.72	19.83	19.94	20.05
60	UA	18.95	18.99	19.03	19.08	19.12	19.16	19.20	19.24	19.28	19.32	19.36	19.41	19.45	19.49	19.53	19.57	19.61	19.65	19.70	19.74	19.78
	FA	17.59	17.70	17.81	17.92	18.03	18.15	18.26	18.37	18.48	18.59	18.70	18.81	18.92	19.03	19.15	19.26	19.37	19.48	19.59	19.70	19.81
59	UA	18.53	18.57	18.61	18.65	18.70	18.74	18.78	18.82	18.86	18.90	18.94	18.99	19.03	19.07	19.11	19.16	19.19	19.23	19.27	19.32	19.36
	FA	17.35	17.46	17.57	17.68	17.79	17.90	18.01	18.13	18.24	18.35	18.46	18.57	18.68	18.79	18.90	19.01	19.13	19.24	19.35	19.46	19.57
58	UA	18.11	18.15	18.19	18.23	18.28	18.32	18.36	18.40	18.44	18.48	18.52	18.56	18.61	18.65	18.69	18.73	18.77	18.81	18.85	18.90	18.94
	FA	17.11	17.22	17.33	17.44	17.55	17.66	17.77	17.88	17.99	18.11	18.22	18.33	18.44	18.55	18.66	18.77	18.88	18.99	19.11	19.22	19.33
57	UA	17.69	17.73	17.77	17.81	17.85	17.90	17.94	17.98	18.02	18.06	18.10	18.14	18.19	18.23	18.27	18.31	18.35	18.39	18.43	18.47	18.52
	FA	16.86	16.98	17.09	17.20	17.31	17.42	17.53	17.64	17.75	17.86	17.97	18.09	18.20	18.31	18.42	18.53	18.64	18.75	18.86	18.97	19.09
56	UA	17.27	17.31	17.35	17.39	17.43	17.48	17.52	17.56	17.60	17.64	17.68	17.72	17.76	17.81	17.85	17.89	17.93	17.97	18.01	18.05	18.10
	FA	16.62	16.73	16.84	16.96	17.07	17.18	17.29	17.40	17.51	17.62	17.73	17.84	17.95	18.07	18.18	18.29	18.40	18.51	18.62	18.73	18.84
55	UA	16.85	16.89	16.93	16.97	17.01	17.05	17.10	17.14	17.18	17.22	17.26	17.30	17.34	17.39	17.43	17.47	17.51	17.55	17.59	17.63	17.67
	FA	16.38	16.49	16.60	16.71	16.82	16.94	17.05	17.16	17.27	17.38	17.49	17.60	17.71	17.82	17.93	18.05	18.16	18.27	18.38	18.49	18.60
54	UA	16.43	16.47	16.51	16.55	16.59	16.63	16.68	16.72	16.76	16.80	16.84	16.88	16.92	16.96	17.01	17.05	17.09	17.13	17.17	17.21	17.25
	FA	16.14	16.25	16.36	16.47	16.58	16.69	16.80	16.92	17.03	17.14	17.25	17.36	17.47	17.58	17.69	17.80	17.92	18.03	18.14	18.25	18.36
53	UA	16.01	16.05	16.09	16.13	16.17	16.21	16.25	16.30	16.34	16.38	16.42	16.46	16.50	16.54	16.59	16.63	16.67	16.71	16.75	16.79	16.83
	FA	15.90	16.01	16.12	16.23	16.34	16.45	16.56	16.67	16.78	16.90	17.01	17.12	17.23	17.34	17.45	17.56	17.67	17.78	17.90	18.01	18.12
52	UA	15.59	15.63	15.67	15.71	15.75	15.79	15.83	15.88	15.92	15.96	16.00	16.04	16.08	16.12	16.16	16.21	16.25	16.29	16.33	16.37	16.41
	FA	15.65	15.76	15.88	15.99	16.10	16.21	16.32	16.43	16.54	16.65	16.76	16.88	16.99	17.10	17.21	17.32	17.43	17.54	17.65	17.76	17.88
51	UA	15.17	15.21	15.25	15.29	15.33	15.37	15.41	15.45	15.50	15.54	15.58	15.62	15.66	15.70	15.74	15.78	15.83	15.87	15.91	15.95	15.99
	FA	15.41	15.52	15.63	15.74	15.86	15.97	16.08	16.19	16.30	16.41	16.52	16.63	16.74	16.86	16.97	17.08	17.19	17.30	17.41	17.52	17.63

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.042	.024
.2	.084	.048
.3	.126	.073
.4	.168	.097
.5	.210	.121
.6	.252	.145
.7	.294	.169
.8	.337	.194
.9	.379	.218

Table 124

Norms for Thigh and Calf of Ten-Year-Old Girls (Thigh = .6078 chest circumference + 2.0237 knee - 11.9752; calf = .3149 chest circumference + 1.5442 knee - 4.4910)

Chest Circumference, Centimeters		Knee Width, Centimeters															
	.	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8
73	Th	46.16	46.56	46.96	47.37	47.77	48.18	48.58	48.99	49.39	49.80	50.20	50.61	51.01	51.42	51.82	52.23
	Ca	29.00	29.31	29.61	29.92	30.23	30.54	30.85	31.16	31.47	31.78	32.09	32.39	32.70	33.01	33.32	33.63
72	Th	45.55	45.95	46.36	46.76	47.17	47.57	47.98	48.38	48.79	49.19	49.59	50.00	50.40	50.81	51.21	51.62
	Ca	28.68	28.99	29.30	29.61	29.92	30.23	30.54	30.84	31.15	31.46	31.77	32.08	32.39	32.70	33.01	33.31
71	Th	44.94	45.34	45.75	46.15	46.56	46.96	47.37	47.77	48.18	48.58	48.99	49.39	49.80	50.20	50.61	51.01
	Ca	28.37	28.68	28.99	29.29	29.60	29.91	30.22	30.53	30.84	31.15	31.46	31.76	32.07	32.38	32.69	33.00
70	Th	44.33	44.74	45.14	45.55	45.95	46.36	46.76	47.17	47.57	47.97	48.38	48.78	49.19	49.59	50.00	50.40
	Ca	28.05	28.36	28.67	28.98	29.29	29.60	29.91	30.21	30.52	30.83	31.14	31.45	31.76	32.07	32.38	32.69
69	Th	43.72	44.13	44.53	44.94	45.34	45.75	46.15	46.56	46.96	47.37	47.77	48.18	48.58	48.99	49.39	49.80
	Ca	27.74	28.05	28.36	28.66	28.97	29.28	29.59	29.90	30.21	30.52	30.83	31.13	31.44	31.75	32.06	32.37
68	Th	43.12	43.52	43.93	44.33	44.74	45.14	45.54	45.95	46.36	46.76	47.16	47.57	47.97	48.38	48.78	49.19
	Ca	27.42	27.73	28.04	28.35	28.66	28.97	29.28	29.58	29.89	30.20	30.51	30.82	31.13	31.44	31.75	32.06
67	Th	42.51	42.91	43.32	43.72	44.13	44.54	44.94	45.34	45.75	46.15	46.56	46.96	47.27	47.77	48.17	48.58
	Ca	27.11	27.42	27.73	28.03	28.34	28.65	28.96	29.27	29.58	29.89	30.20	30.51	30.81	31.12	31.43	31.74
66	Th	41.90	42.31	42.71	43.11	43.52	43.92	44.33	44.73	45.14	45.54	45.95	46.35	46.76	47.16	47.57	47.97
	Ca	26.79	27.10	27.41	27.72	28.03	28.34	28.65	28.95	29.26	29.57	29.88	30.19	30.50	30.81	31.12	31.43
65	Th	41.29	41.70	42.10	42.51	42.91	43.32	43.72	44.13	44.53	44.94	45.34	45.75	46.15	46.55	46.96	47.36
	Ca	26.48	26.79	27.10	27.40	27.71	28.02	28.33	28.64	28.95	29.26	29.57	29.88	30.18	30.49	30.80	31.11
64	Th	40.69	41.09	41.49	41.90	42.30	42.71	43.11	43.52	43.92	44.33	44.73	45.14	45.54	45.95	46.35	46.76
	Ca	26.16	26.47	26.78	27.09	27.40	27.71	28.02	28.33	28.63	28.94	29.25	29.56	29.87	30.18	30.49	30.80
63	Th	40.08	40.48	40.89	41.29	41.70	42.10	42.51	42.91	43.32	43.72	44.12	44.53	44.93	45.34	45.74	46.15
	Ca	25.85	26.16	26.47	26.77	27.08	27.39	27.70	28.01	28.32	28.63	28.94	29.25	29.55	29.86	30.17	30.48
62	Th	39.47	39.87	40.28	40.68	41.09	41.49	41.90	42.30	42.71	43.11	43.52	43.92	44.33	44.73	45.14	45.54
	Ca	25.53	25.84	26.15	26.46	26.77	27.08	27.39	27.70	28.00	28.31	28.62	28.93	29.24	29.55	29.86	30.17
61	Th	38.86	39.27	39.67	40.08	40.48	40.89	41.29	41.69	42.10	42.50	42.91	43.31	43.72	44.12	44.53	44.93
	Ca	25.22	25.53	25.84	26.14	26.45	26.76	27.07	27.38	27.69	28.00	28.31	28.62	28.92	29.23	29.54	29.85
60	Th	38.25	38.66	39.06	39.47	39.87	40.28	40.68	41.09	41.49	41.90	42.30	42.71	43.11	43.52	43.92	44.33
	Ca	24.90	25.21	25.52	25.83	26.14	26.45	26.76	27.07	27.37	27.68	27.99	28.30	28.61	28.92	29.23	29.54
59	Th	37.65	38.05	38.46	38.86	39.27	39.67	40.07	40.48	40.88	41.29	41.69	42.10	42.50	42.91	43.31	43.72
	Ca	24.59	24.90	25.21	25.52	25.82	26.13	26.44	26.75	27.06	27.37	27.68	27.99	28.29	28.60	28.91	29.22
58	Th	37.04	37.44	37.85	38.25	38.66	39.06	39.47	39.87	40.28	40.68	41.09	41.49	41.89	42.30	42.70	43.11
	Ca	24.27	24.58	24.89	25.20	25.51	25.82	26.13	26.44	26.74	27.05	27.36	27.67	27.98	28.29	28.60	28.91
57	Th	36.43	36.84	37.24	37.64	38.05	38.45	38.86	39.26	39.67	40.07	40.48	40.88	41.29	41.69	42.10	42.50
	Ca	23.96	24.27	24.58	24.89	25.19	25.50	25.81	26.12	26.43	26.74	27.05	27.36	27.66	27.97	28.28	28.59
56	Th	35.82	36.23	36.63	37.04	37.44	37.85	38.25	38.66	39.06	39.47	39.87	40.27	40.68	41.08	41.49	41.89
	Ca	23.64	23.95	24.26	24.57	24.88	25.19	25.50	25.81	26.11	26.42	26.73	27.04	27.35	27.66	27.97	28.28
55	Th	35.21	35.62	36.02	36.43	36.83	37.24	37.64	38.05	38.45	38.86	39.26	39.67	40.07	40.48	40.88	41.29
	Ca	23.33	23.64	23.95	24.26	24.56	24.87	25.18	25.49	25.80	26.11	26.42	26.73	27.04	27.34	27.65	27.96
54	Th	34.61	35.02	35.42	35.82	36.23	36.63	37.04	37.44	37.85	38.25	38.65	39.06	39.46	39.87	40.27	40.68
	Ca	23.01	23.32	23.63	23.94	24.25	24.56	24.87	25.18	25.48	25.79	26.10	26.41	26.72	27.03	27.34	27.65
53	Th	34.00	34.40	34.81	35.21	35.62	36.02	36.43	36.83	37.24	37.64	38.05	38.45	38.86	39.26	39.67	40.07
	Ca	22.70	23.01	23.32	23.63	23.93	24.24	24.55	24.86	25.17	25.48	25.79	26.10	26.41	26.71	27.02	27.33
52	Th	33.39	33.80	34.20	34.61	35.01	35.42	35.82	36.22	36.63	37.03	37.44	37.84	38.25	38.65	39.06	39.46
	Ca	22.38	22.69	23.00	23.31	23.62	23.93	24.24	24.55	24.86	25.16	25.48	25.78	26.09	26.40	26.71	27.02
51	Th	32.78	33.19	33.59	34.00	34.40	34.81	35.21	35.62	36.02	36.43	36.83	37.24	37.64	38.05	38.45	38.85
	Ca	22.07	22.38	22.69	23.00	23.30	23.61	23.92	24.23	24.54	24.85	25.16	25.47	25.78	26.08	26.39	26.70

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.202	0	.154
.1	.061	.263	.031	.186
.2	.122	.324	.063	.217
.3	.182	.385	.094	.249
.4	.243	.445	.126	.280
.5	.304	.506	.157	.312
.6	.365	.567	.189	.343
.7	.425	.628	.220	.375
.8	.486	.689	.252	.406
.9	.547	.749	.283	.438

Table 125

Norms for Upper Arm and Forearm of Eleven-Year-Old Girls (Upper arm = .2656 chest circumference + .6814 elbow - 1.2025; forearm = .1319 chest circumference + 1.7325 elbow + 1.7212)

Chest Circumference, Centimeters		Elbow Width, Centimeters																						
		4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7
82	UA	24.54	24.63	24.72	24.81	24.90	24.98	25.07	25.16	25.25	25.34	25.42	25.51	25.60	25.69	25.78	25.87	25.95	26.04	26.13	26.22	26.31	26.39	26.48
	FA	20.33	20.51	20.68	20.85	21.03	21.20	21.37	21.55	21.72	21.89	22.07	22.24	22.41	22.59	22.76	22.93	23.11	23.28	23.45	23.63	23.80	23.97	24.14
80	UA	24.01	24.10	24.19	24.28	24.36	24.45	24.54	24.63	24.72	24.81	24.89	24.98	25.07	25.16	25.25	25.33	25.42	25.51	25.60	25.69	25.77	25.86	25.95
	FA	20.07	20.24	20.42	20.59	20.76	20.94	21.11	21.28	21.46	21.63	21.80	21.98	22.15	22.32	22.49	22.67	22.84	23.01	23.19	23.36	23.53	23.70	23.88
78	UA	23.48	23.57	23.66	23.75	23.83	23.92	24.01	24.10	24.19	24.27	24.36	24.45	24.54	24.63	24.71	24.80	24.89	24.98	25.07	25.16	25.24	25.33	25.42
	FA	19.81	19.98	20.15	20.33	20.50	20.67	20.85	21.02	21.19	21.36	21.54	21.71	21.88	22.06	22.23	22.40	22.58	22.75	22.92	23.10	23.27	23.44	23.62
76	UA	22.95	23.04	23.13	23.21	23.30	23.39	23.48	23.57	23.65	23.74	23.83	23.92	24.01	24.10	24.19	24.27	24.36	24.45	24.54	24.62	24.71	24.80	24.99
	FA	19.54	19.72	19.89	20.06	20.23	20.41	20.58	20.75	20.93	21.10	21.27	21.45	21.62	21.79	21.97	22.14	22.31	22.49	22.66	22.83	23.01	23.18	23.35
74	UA	22.42	22.51	22.59	22.69	22.77	22.86	22.95	23.04	23.12	23.21	23.30	23.39	23.48	23.56	23.65	23.74	23.83	23.92	24.00	24.09	24.18	24.27	24.36
	FA	19.28	19.45	19.62	19.80	19.97	20.14	20.32	20.49	20.66	20.84	21.01	21.19	21.36	21.53	21.70	21.88	22.05	22.22	22.40	22.57	22.74	22.92	23.09
72	UA	21.89	21.98	22.06	22.15	22.24	22.33	22.42	22.50	22.59	22.68	22.77	22.86	22.94	23.03	23.12	23.21	23.30	23.39	23.47	23.56	23.65	23.74	23.83
	FA	19.01	19.19	19.36	19.53	19.71	19.88	20.05	20.23	20.40	20.57	20.75	20.92	21.09	21.27	21.44	21.61	21.79	21.96	22.13	22.31	22.48	22.65	22.83
70	UA	21.36	21.44	21.53	21.62	21.71	21.80	21.89	21.97	22.06	22.15	22.24	22.33	22.41	22.50	22.59	22.68	22.77	22.85	22.94	23.03	23.12	23.21	23.29
	FA	18.75	18.92	19.10	19.27	19.44	19.62	19.79	19.96	20.14	20.31	20.48	20.66	20.83	21.00	21.19	21.35	21.52	21.70	21.87	22.04	22.22	22.39	22.56
68	UA	20.82	20.91	21.00	21.09	21.18	21.27	21.35	21.44	21.53	21.62	21.71	21.79	21.88	21.97	22.06	22.15	22.23	22.32	22.41	22.50	22.59	22.68	22.76
	FA	18.49	18.66	18.83	19.01	19.18	19.35	19.53	19.70	19.87	20.05	20.22	20.39	20.57	20.74	20.91	21.09	21.26	21.43	21.61	21.78	21.95	22.12	22.30
66	UA	20.29	20.38	20.47	20.56	20.65	20.73	20.82	20.91	21.00	21.09	21.17	21.26	21.35	21.44	21.53	21.62	21.70	21.79	21.88	21.97	22.06	22.14	22.23
	FA	18.22	18.40	18.57	18.74	18.92	19.09	19.26	19.44	19.61	19.78	19.96	20.13	20.30	20.48	20.65	20.82	20.99	21.17	21.34	21.51	21.69	21.86	22.03
64	UA	19.76	19.85	19.94	20.03	20.11	20.20	20.29	20.38	20.47	20.56	20.64	20.73	20.82	20.91	21.00	21.08	21.17	21.26	21.35	21.44	21.53	21.61	21.70
	FA	17.96	18.13	18.31	18.48	18.65	18.83	19.00	19.17	19.35	19.52	19.69	19.86	20.04	20.21	20.38	20.56	20.73	20.90	21.08	21.25	21.42	21.60	21.77
62	UA	19.23	19.32	19.41	19.50	19.58	19.67	19.76	19.85	19.94	20.02	20.11	20.20	20.29	20.38	20.46	20.55	20.64	20.73	20.82	20.91	20.99	21.08	21.17
	FA	17.70	17.87	18.04	18.22	18.39	18.56	18.73	18.91	19.08	19.25	19.43	19.60	19.77	19.95	20.12	20.29	20.47	20.64	20.81	20.99	21.16	21.33	21.51
60	UA	18.70	18.79	18.88	18.96	19.05	19.14	19.23	19.32	19.40	19.49	19.58	19.67	19.76	19.85	19.93	20.02	20.11	20.20	20.29	20.37	20.46	20.55	20.54
	FA	17.43	17.60	17.78	17.95	18.12	18.30	18.47	18.64	18.82	18.99	19.16	19.34	19.51	19.68	19.86	20.03	20.20	20.38	20.55	20.72	20.90	21.07	21.24
58	UA	18.17	18.26	18.34	18.43	18.52	18.61	18.70	18.79	18.87	18.96	19.05	19.14	19.23	19.31	19.40	19.49	19.58	19.67	19.76	19.84	19.93	20.02	20.11
	FA	17.17	17.34	17.51	17.69	17.86	18.03	18.21	18.38	18.55	18.73	18.90	19.07	19.25	19.42	19.59	19.77	19.94	20.11	20.29	20.46	20.63	20.81	20.98
56	UA	17.64	17.73	17.81	17.90	17.99	18.08	18.17	18.25	18.34	18.43	18.52	18.61	18.70	18.78	18.87	18.96	19.05	19.14	19.22	19.31	19.40	19.49	19.58
	FA	16.90	17.08	17.25	17.42	17.60	17.77	17.94	18.12	18.29	18.46	18.64	18.81	18.98	19.16	19.33	19.50	19.68	19.95	20.02	20.20	20.37	20.54	20.72
54	UA	17.11	17.19	17.28	17.37	17.46	17.55	17.64	17.72	17.81	17.90	17.99	18.08	18.16	18.25	18.34	18.43	18.52	18.60	18.69	18.78	18.87	18.96	19.05
	FA	16.54	16.81	16.99	17.16	17.33	17.51	17.69	17.85	18.03	18.20	18.37	18.55	18.72	18.39	19.07	19.24	19.41	19.59	19.76	19.93	20.11	20.28	20.45
52	UA	16.58	16.66	16.75	16.84	16.93	17.02	17.10	17.19	17.28	17.37	17.46	17.54	17.63	17.72	17.81	17.90	17.99	18.07	18.16	18.25	18.34	18.43	18.51
	FA	16.38	16.55	16.72	16.90	17.07	17.24	17.42	17.59	17.76	17.94	18.11	18.29	18.46	18.63	18.90	18.98	19.15	19.32	19.49	19.67	19.84	20.01	20.19
50	UA	16.04	16.13	16.22	16.31	16.40	16.48	16.57	16.66	16.75	16.84	16.93	17.01	17.10	17.19	17.29	17.37	17.45	17.54	17.63	17.72	17.81	17.89	17.98
	FA	16.11	16.29	16.46	16.63	16.91	16.98	17.15	17.33	17.50	17.67	17.84	18.02	18.19	18.36	18.54	18.71	18.89	19.06	19.23	19.40	19.58	19.75	19.92

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.027	.013
.2	.053	.026
.3	.080	.040
.4	.106	.053
.5	.133	.066
.6	.159	.079
.7	.186	.092
.8	.212	.106
.9	.239	.119
1.0	.266	.132
1.1	.292	.145
1.2	.319	.158
1.3	.345	.171
1.4	.372	.185
1.5	.398	.198
1.6	.425	.211
1.7	.452	.224
1.8	.478	.237
1.9	.505	.251

Table 126

Norms for Thigh and Calf of Eleven-Year-Old Girls (Thigh = .5198 chest circumference + 2.1606 knee - 7.6431; calf = .2240 chest circumference + 1.7214 knee - .0867)

Chest Circumference, Centimeters		Knee Width, Centimeters																			
		6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4
82	Th	49.24	49.67	50.10	50.54	50.97	51.40	51.83	52.27	52.70	53.13	53.56	53.99	54.43	54.86	55.29	55.72	56.15	56.59	57.02	57.45
	Ca	29.64	29.99	30.33	30.68	31.02	31.36	31.71	32.05	32.40	32.74	33.09	33.43	33.77	34.12	34.46	34.91	35.15	35.50	35.94	36.18
80	Th	48.20	48.63	49.07	49.50	49.93	50.36	50.79	51.23	51.66	52.09	52.52	52.95	53.39	53.82	54.25	54.68	55.11	55.55	55.98	56.51
	Ca	29.19	29.54	29.88	30.23	30.57	30.92	31.26	31.60	31.95	32.29	32.64	32.98	33.33	33.67	34.01	34.36	34.70	35.05	35.39	35.74
78	Th	47.16	47.59	48.03	48.46	48.89	49.32	49.75	50.19	50.62	51.05	51.48	51.91	52.35	52.78	53.21	53.64	54.08	54.51	54.94	55.37
	Ca	28.75	29.10	29.44	29.78	30.12	30.47	30.91	31.16	31.50	31.85	32.19	32.53	32.98	33.22	33.57	33.91	34.26	34.60	34.94	35.29
76	Th	46.12	46.55	46.99	47.42	47.95	48.28	48.71	49.15	49.58	50.01	50.44	50.37	51.31	51.74	52.17	52.60	53.04	53.47	53.90	54.33
	Ca	28.30	28.64	28.99	29.33	29.68	30.02	30.36	30.71	31.05	31.40	31.74	32.09	32.43	32.77	33.12	33.46	33.81	34.15	34.50	34.84
74	Th	45.08	45.51	45.95	46.38	46.81	47.24	47.67	48.11	48.54	48.97	49.40	49.84	50.27	50.70	51.13	51.56	52.00	52.43	52.86	53.29
	Ca	27.85	28.19	28.54	28.88	29.23	29.57	29.92	30.26	30.60	30.95	31.29	31.64	31.98	32.33	32.67	33.01	33.36	33.70	34.05	34.39
72	Th	44.04	44.47	44.91	45.34	45.77	46.20	46.64	47.07	47.50	47.93	48.36	48.80	49.23	49.66	50.09	50.52	50.96	51.39	51.82	52.25
	Ca	27.40	27.75	28.09	28.44	28.78	29.12	29.47	29.81	30.16	30.50	30.85	31.19	31.53	31.88	32.22	32.57	32.91	33.26	33.60	33.94
70	Th	43.00	43.43	43.87	44.30	44.73	45.16	45.60	46.03	46.46	46.99	47.32	47.76	48.19	48.62	49.05	49.48	49.92	50.35	50.78	51.21
	Ca	26.95	27.30	27.64	27.99	28.33	28.68	29.02	29.36	29.71	30.05	30.40	30.74	31.09	31.43	31.77	32.12	32.46	32.81	33.15	33.50
68	Th	41.96	42.40	42.93	43.26	43.69	44.12	44.56	44.99	45.42	45.85	46.28	46.72	47.15	47.58	48.01	48.45	48.88	49.31	49.74	50.17
	Ca	26.51	26.85	27.20	27.54	27.98	28.23	28.57	28.92	29.26	29.61	29.95	30.29	30.64	30.98	31.33	31.67	32.02	32.36	32.70	33.05
66	Th	40.92	41.36	41.79	42.22	42.65	43.08	43.52	43.95	44.38	44.31	45.24	45.69	46.11	46.54	46.97	47.41	47.94	48.27	48.70	49.13
	Ca	26.06	26.40	26.75	27.09	27.44	27.78	28.12	28.47	28.81	29.16	29.50	29.35	30.19	30.53	30.98	31.22	31.57	31.91	32.26	32.60
64	Th	39.88	40.32	40.75	41.18	41.61	42.04	42.48	42.91	43.34	43.77	44.21	44.64	45.07	45.50	45.93	46.37	46.80	47.23	47.66	48.09
	Ca	25.61	25.95	26.30	26.64	26.99	27.33	27.68	28.02	28.36	28.71	29.05	29.40	29.74	30.09	30.43	30.77	31.12	31.46	31.91	32.15
62	Th	38.84	39.28	39.71	40.14	40.57	41.01	41.44	41.87	42.30	42.73	43.17	43.60	44.03	44.46	44.99	45.33	45.76	46.19	46.62	47.05
	Ca	25.16	25.51	25.85	26.20	26.54	26.98	27.23	27.57	27.92	28.26	28.61	28.95	29.29	29.64	29.98	30.33	30.67	31.02	31.36	31.70
60	Th	37.80	38.24	38.67	39.10	39.53	39.97	40.40	40.83	41.26	41.69	42.13	42.50	42.99	43.42	43.95	44.29	44.72	45.15	45.58	46.02
	Ca	24.71	25.06	25.40	25.75	26.09	26.44	26.78	27.12	27.47	27.91	28.16	28.50	28.95	29.19	29.53	29.88	30.22	30.57	30.91	31.26
58	Th	36.77	37.20	37.63	38.06	38.49	38.93	39.36	39.79	40.22	40.65	41.09	41.52	41.95	42.38	42.91	43.25	43.68	44.11	44.54	44.98
	Ca	24.27	24.61	24.96	25.30	25.64	25.99	26.33	26.68	27.02	27.37	27.71	28.05	28.40	28.74	29.09	29.43	29.78	30.12	30.46	30.31
56	Th	35.73	36.16	36.59	37.02	37.45	37.99	38.32	38.75	39.18	39.61	40.05	40.48	40.91	41.34	41.78	42.21	42.64	43.07	43.50	43.94
	Ca	23.82	24.16	24.51	24.95	25.20	25.54	25.88	26.23	26.57	26.92	27.26	27.61	27.95	28.29	28.64	28.98	29.33	29.67	30.02	30.36
54	Th	34.69	35.12	35.55	35.98	36.41	36.85	37.28	37.71	38.14	38.58	39.01	39.44	39.87	40.30	40.74	41.17	41.60	42.03	42.46	42.90
	Ca	23.37	23.71	24.06	24.40	24.75	25.09	25.44	25.78	26.12	26.47	26.91	27.16	27.50	27.85	28.19	28.53	28.88	29.22	29.57	29.91
52	Th	33.65	34.08	34.51	34.94	35.37	35.81	36.24	36.67	37.10	37.54	37.97	38.40	38.83	39.26	39.70	40.13	40.56	40.99	41.42	41.86
	Ca	22.92	23.27	23.61	23.96	24.30	24.64	24.99	25.33	25.68	26.02	26.37	26.71	27.05	27.40	27.74	28.09	28.43	28.78	29.12	29.46
50	Th	32.61	33.04	33.47	33.90	34.34	34.77	35.20	35.63	36.06	36.50	36.93	37.36	37.79	38.22	38.56	39.09	39.52	39.95	40.39	40.82
	Ca	22.47	22.92	23.16	23.51	23.85	24.20	24.54	24.88	25.23	25.57	25.92	26.26	26.60	26.95	27.29	27.64	27.98	28.33	28.67	29.02

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.216	0	.172
.1	.052	.268	.022	.195
.2	.104	.320	.045	.217
.3	.156	.372	.067	.239
.4	.208	.424	.090	.262
.5	.260	.476	.112	.284
.6	.312	.528	.134	.307
.7	.364	.580	.157	.329
.8	.416	.632	.179	.351
.9	.468	.684	.202	.374
1.0	.520	.736	.224	.396
1.1	.572	.788	.246	.419
1.2	.624	.840	.269	.441
1.3	.676	.892	.291	.463
1.4	.728	.944	.314	.486
1.5	.780	.996	.336	.508
1.6	.832	1.048	.358	.531
1.7	.884	1.100	.381	.553
1.8	.936	1.152	.403	.575
1.9	.988	1.204	.426	.598

Table 127

Norms for Upper Arm and Forearm of Twelve-Year-Old Girls (Upper arm = .2884 chest circumference + 1.2214 elbow - 4.5638; forearm = .1673 chest circumference + 1.4017 elbow + 1.4407)

Chest Circumference, Centimeters		Elbow Width, Centimeters																							
		4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
86	UA	25.96	25.98	26.10	26.22	26.35	26.47	26.59	26.71	26.83	26.96	27.08	27.20	27.32	27.44	27.57	27.69	27.81	27.93	28.06	28.18	28.30	28.42	28.54	28.67
	FA	22.28	22.42	22.56	22.70	22.84	22.98	23.12	23.26	23.40	23.54	23.68	23.82	23.96	24.10	24.24	24.38	24.52	24.66	24.80	24.94	25.08	25.22	25.36	25.50
84	UA	25.28	25.40	25.52	25.65	25.77	25.89	26.01	26.14	26.26	26.38	26.50	26.62	26.75	26.87	26.99	27.11	27.23	27.36	27.48	27.60	27.72	27.85	27.97	28.09
	FA	21.94	22.08	22.22	22.36	22.50	22.64	22.78	22.92	23.06	23.20	23.34	23.48	23.62	23.76	23.90	24.04	24.18	24.32	24.46	24.60	24.75	24.89	25.03	25.17
82	UA	24.70	24.83	24.95	25.07	25.19	25.31	25.44	25.56	25.68	25.80	25.92	26.05	26.17	26.29	26.41	26.54	26.66	26.78	26.90	27.02	27.15	27.27	27.39	27.51
	FA	21.61	21.75	21.89	22.03	22.17	22.31	22.45	22.59	22.73	22.87	23.01	23.15	23.29	23.43	23.57	23.71	23.85	23.99	24.13	24.27	24.41	24.55	24.69	24.83
80	UA	24.13	24.25	24.37	24.49	24.62	24.74	24.86	24.98	25.10	25.23	25.35	25.47	25.59	25.71	25.84	25.96	26.08	26.20	26.33	26.45	26.57	26.69	26.81	26.94
	FA	21.27	21.41	21.55	21.69	21.83	21.97	22.11	22.25	22.39	22.53	22.67	22.81	22.95	23.09	23.23	23.38	23.52	23.66	23.80	23.94	24.08	24.22	24.36	24.50
78	UA	23.55	23.67	23.79	23.92	24.04	24.16	24.28	24.40	24.53	24.65	24.77	24.89	25.02	25.14	25.26	25.38	25.50	25.63	25.75	25.87	25.99	26.11	26.24	26.36
	FA	20.94	21.08	21.22	21.36	21.50	21.64	21.78	21.92	22.06	22.20	22.34	22.48	22.62	22.76	22.90	23.04	23.18	23.32	23.46	23.60	23.74	23.88	24.02	24.16
76	UA	22.97	23.10	23.22	23.34	23.46	23.58	23.71	23.83	23.95	24.07	24.19	24.32	24.44	24.56	24.68	24.81	24.93	25.05	25.17	25.29	25.42	25.54	25.66	25.78
	FA	20.60	20.74	20.88	21.02	21.16	21.30	21.44	21.58	21.72	21.86	22.01	22.15	22.29	22.43	22.57	22.71	22.85	22.99	23.13	23.27	23.41	23.55	23.69	23.83
74	UA	22.40	22.52	22.64	22.76	22.88	23.01	23.13	23.25	23.37	23.50	23.62	23.74	23.86	23.98	24.11	24.23	24.35	24.47	24.59	24.72	24.84	24.96	25.08	25.21
	FA	20.27	20.41	20.55	20.69	20.83	20.97	21.11	21.25	21.39	21.53	21.67	21.81	21.95	22.09	22.23	22.37	22.51	22.65	22.79	22.93	23.07	23.21	23.35	23.49
72	UA	21.82	21.94	22.06	22.19	22.31	22.43	22.55	22.67	22.80	22.92	23.04	23.16	23.29	23.41	23.53	23.65	23.77	23.90	24.02	24.14	24.26	24.38	24.51	24.63
	FA	19.93	20.07	20.21	20.35	20.49	20.63	20.78	20.92	21.06	21.20	21.34	21.48	21.62	21.76	21.90	22.04	22.18	22.32	22.46	22.60	22.74	22.88	23.02	23.16
70	UA	21.24	21.36	21.49	21.61	21.73	21.85	21.98	22.10	22.22	22.34	22.46	22.59	22.71	22.83	22.95	23.07	23.20	23.32	23.44	23.56	23.69	23.81	23.93	24.05
	FA	19.60	19.74	19.88	20.02	20.16	20.30	20.44	20.58	20.72	20.86	21.00	21.14	21.28	21.42	21.56	21.70	21.84	21.98	22.12	22.26	22.40	22.54	22.68	22.82
68	UA	20.67	20.79	20.91	21.03	21.15	21.28	21.40	21.52	21.64	21.77	21.89	22.01	22.13	22.25	22.38	22.50	22.62	22.74	22.86	22.99	23.11	23.23	23.35	23.48
	FA	19.26	19.41	19.55	19.69	19.83	19.97	20.11	20.25	20.39	20.53	20.67	20.81	20.95	21.09	21.23	21.37	21.51	21.65	21.79	21.93	22.07	22.21	22.35	22.49
66	UA	20.09	20.21	20.33	20.46	20.58	20.70	20.82	20.94	21.07	21.19	21.31	21.43	21.55	21.68	21.80	21.92	22.04	22.17	22.29	22.41	22.53	22.65	22.78	22.90
	FA	18.93	19.07	19.21	19.35	19.49	19.63	19.77	19.91	20.05	20.19	20.33	20.47	20.61	20.75	20.89	21.03	21.17	21.31	21.45	21.59	21.73	21.87	22.01	22.15
64	UA	19.51	19.63	19.76	19.88	20.00	20.12	20.25	20.37	20.49	20.61	20.73	20.86	20.98	21.10	21.22	21.34	21.47	21.59	21.71	21.83	21.96	22.08	22.20	22.32
	FA	18.60	18.74	18.88	19.02	19.16	19.30	19.44	19.58	19.72	19.86	20.00	20.14	20.28	20.42	20.56	20.70	20.84	20.98	21.12	21.26	21.40	21.54	21.68	21.82
62	UA	18.94	19.06	19.18	19.30	19.42	19.55	19.67	19.79	19.91	20.03	20.16	20.28	20.40	20.52	20.65	20.77	20.89	21.01	21.13	21.26	21.38	21.50	21.62	21.74
	FA	18.26	18.40	18.54	18.68	18.82	18.96	19.10	19.24	19.38	19.52	19.66	19.80	19.94	20.08	20.22	20.36	20.50	20.64	20.78	20.92	21.06	21.20	21.34	21.49
60	UA	18.36	18.48	18.60	18.73	18.85	18.97	19.09	19.21	19.34	19.46	19.58	19.70	19.82	19.95	20.07	20.19	20.31	20.44	20.56	20.68	20.80	20.92	21.05	21.17
	FA	17.93	18.07	18.21	18.35	18.49	18.63	18.77	18.91	19.05	19.19	19.33	19.47	19.61	19.75	19.89	20.03	20.17	20.31	20.45	20.59	20.73	20.87	21.01	21.15
58	UA	17.78	17.90	18.03	18.15	18.27	18.39	18.51	18.64	18.76	18.88	19.00	19.13	19.25	19.37	19.49	19.61	19.74	19.86	19.98	20.10	20.22	20.35	20.47	20.59
	FA	17.59	17.73	17.87	18.01	18.15	18.29	18.43	18.57	18.71	18.85	18.99	19.13	19.27	19.41	19.55	19.69	19.83	19.97	20.11	20.26	20.40	20.54	20.68	20.82
56	UA	17.21	17.33	17.45	17.57	17.69	17.82	17.94	18.06	18.18	18.30	18.43	18.55	18.67	18.79	18.92	19.04	19.16	19.28	19.40	19.53	19.65	19.77	19.89	20.01
	FA	17.26	17.40	17.54	17.68	17.82	17.96	18.10	18.24	18.38	18.52	18.66	18.80	18.94	19.08	19.22	19.36	19.50	19.64	19.78	19.92	20.06	20.20	20.34	20.48
54	UA	16.63	16.75	16.87	16.99	17.12	17.24	17.36	17.48	17.61	17.73	17.85	17.97	18.09	18.22	18.34	18.46	18.58	18.70	18.83	18.95	19.07	19.19	19.32	19.44
	FA	16.92	17.06	17.20	17.34	17.48	17.62	17.76	17.90	18.04	18.18	18.32	18.46	18.60	18.74	18.89	19.03	19.17	19.31	19.45	19.59	19.73	19.87	20.01	20.15
52	UA	16.05	16.17	16.30	16.42	16.54	16.66	16.78	16.91	17.03	17.15	17.27	17.39	17.52	17.64	17.76	17.88	18.01	18.13	18.25	18.37	18.49	18.62	18.74	18.86
	FA	16.59	16.73	16.87	17.01	17.15	17.29	17.43	17.57	17.71	17.85	17.99	18.13	18.27	18.41	18.55	18.69	18.83	18.97	19.11	19.25	19.39	19.53	19.67	19.81

Interpolation Table

Chest Circumference	Elbow	
	Upper Arm	Forearm
	0	0
0	0	0
.1	.029	.017
.2	.058	.033
.3	.087	.050
.4	.115	.067
.5	.144	.084
.6	.173	.100
.7	.202	.117
.8	.231	.134
.9	.260	.151
1.0	.288	.167
1.1	.317	.184
1.2	.346	.201
1.3	.375	.217
1.4	.404	.234
1.5	.433	.251
1.6	.461	.268
1.7	.490	.284
1.8	.519	.301
1.9	.548	.318

Table 128

Norms for Thigh and Calf of Twelve-Year-Old Girls (Thigh = .5254 chest circumference + 2.4632 knee - 9.8748; calf = .2354 chest circumference + 1.8946 knee - 2.0717)

Chest Circumference, Centimeters		Knee Width, Centimeters																					
		6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6
86	Th	51.07.	51.57	52.06	52.55	53.04	53.54	54.03	54.52	55.02	55.51	56.00	56.49	56.99	57.48	57.97	58.46	58.96	59.45	59.94	60.43	60.93	61.42
	Ca	30.30	30.68	31.06	31.43	31.81	32.19	32.57	32.95	33.33	33.71	34.09	34.47	34.85	35.22	35.60	35.98	36.36	36.74	37.12	37.50	37.88	38.26
84	Th	50.02	50.52	51.01	51.50	51.99	52.49	52.98	53.47	53.96	54.46	54.95	55.44	55.93	56.43	56.92	57.41	57.91	58.40	58.89	59.38	59.88	60.37
	Ca	29.83	30.21	30.59	30.96	31.34	31.72	32.10	32.48	32.86	33.24	33.62	34.00	34.37	34.75	35.13	35.51	35.89	36.27	36.65	37.03	37.41	37.78
82	Th	48.97	49.47	49.96	50.45	50.94	51.44	51.93	52.42	52.91	53.41	54.90	54.39	54.89	55.38	55.87	56.36	56.85	57.35	57.84	58.33	58.83	59.32
	Ca	29.36	29.74	30.11	30.49	30.87	31.25	31.63	32.01	32.39	32.77	33.15	33.52	33.90	34.28	34.66	35.04	35.52	35.80	36.18	36.56	36.93	37.31
80	Th	47.92	48.41	48.91	49.40	49.89	50.38	50.88	51.37	51.86	52.36	52.85	53.34	53.83	54.33	54.82	55.31	55.80	56.30	56.79	57.28	57.77	58.27
	Ca	28.89	29.26	29.64	30.02	30.40	30.78	31.16	31.54	31.92	32.30	32.67	33.05	33.43	33.81	34.19	34.57	34.95	35.33	35.71	36.09	36.46	36.84
78	Th	46.87	47.36	47.86	48.35	48.84	49.33	49.83	50.32	50.81	51.30	51.80	52.29	52.78	53.28	53.77	54.26	54.75	55.25	55.74	56.23	56.72	57.22
	Ca	28.41	28.79	29.17	29.55	29.93	30.31	30.69	31.07	31.45	31.83	32.20	32.58	32.96	33.34	33.72	34.10	34.48	34.86	35.24	35.61	35.99	36.37
76	Th	45.82	46.31	46.81	47.30	47.79	48.28	48.78	49.27	49.76	50.25	50.75	51.24	51.73	52.22	52.72	53.21	53.70	54.19	54.69	55.18	55.67	56.17
	Ca	27.94	28.32	28.70	29.08	29.46	29.84	30.22	30.60	30.98	31.35	31.73	32.11	32.49	32.87	33.25	33.63	34.01	34.39	34.76	35.14	35.52	35.90
74	Th	44.77	45.26	45.75	46.25	46.74	47.23	47.73	48.22	48.71	49.20	49.70	50.19	50.68	51.17	51.67	52.16	52.65	53.14	53.64	54.13	54.62	55.11
	Ca	27.47	27.85	28.23	28.61	28.99	29.37	29.75	30.13	30.50	30.88	31.26	31.64	32.02	32.40	32.78	33.16	33.54	33.91	34.29	34.67	35.05	35.43
72	Th	43.72	44.21	44.70	45.20	45.69	46.18	46.67	47.17	47.66	48.15	48.64	49.14	49.63	50.12	50.62	51.11	51.60	52.09	52.59	53.08	53.57	54.06
	Ca	27.00	27.38	27.76	28.14	28.52	28.90	29.28	29.65	30.03	30.41	30.79	31.17	31.55	31.93	32.31	32.69	33.07	33.44	33.82	34.20	34.58	34.96
70	Th	42.67	43.16	43.65	44.15	44.64	45.13	45.62	46.12	46.61	47.10	47.59	48.09	48.58	49.07	49.56	50.06	50.55	51.04	51.54	52.03	52.52	53.01
	Ca	26.53	26.91	27.29	27.67	28.05	28.43	28.81	29.18	29.56	29.94	30.32	30.70	31.08	31.46	31.84	32.22	32.59	32.97	33.35	33.73	34.11	34.49
68	Th	41.62	42.11	42.60	43.09	43.59	44.08	44.57	45.07	45.56	46.05	46.54	47.04	47.53	48.02	48.51	49.01	49.50	49.99	50.48	50.98	51.47	51.96
	Ca	26.06	26.44	26.82	27.20	27.58	27.96	28.33	28.71	29.09	29.47	29.85	30.23	30.61	30.99	31.37	31.74	32.12	32.50	32.89	33.26	33.64	34.02
66	Th	40.57	41.06	41.55	42.04	42.54	43.03	43.52	44.01	44.51	45.00	45.49	45.99	46.48	46.97	47.46	47.96	48.45	48.94	49.43	49.93	50.42	50.91
	Ca	25.59	25.97	26.35	26.73	27.11	27.48	27.86	28.24	28.62	29.00	29.38	29.76	30.14	30.52	30.90	31.27	31.65	32.03	32.41	32.79	33.17	33.55
64	Th	39.52	40.01	40.50	40.99	41.49	41.98	42.47	42.96	43.46	43.95	44.44	44.93	45.43	45.92	46.41	46.90	47.40	47.89	48.38	48.88	49.37	49.86
	Ca	25.12	25.50	25.88	26.26	26.64	27.01	27.39	27.77	28.15	28.53	28.91	29.29	29.67	30.05	30.42	30.80	31.18	31.56	31.94	32.32	32.70	33.08
62	Th	38.46	38.96	39.45	39.94	40.44	40.93	41.42	41.91	42.41	42.90	43.39	43.88	44.38	44.87	45.36	45.85	46.35	46.84	47.33	47.82	48.32	48.81
	Ca	24.65	25.03	25.41	25.79	26.16	26.54	26.92	27.30	27.68	28.06	28.44	28.82	29.20	29.57	29.95	30.33	30.71	31.09	31.47	31.85	32.23	32.61
60	Th	37.41	37.91	38.40	38.89	39.38	39.88	40.37	40.86	41.35	41.85	42.34	42.83	43.33	43.82	44.31	44.80	45.30	45.79	46.28	46.77	47.27	47.76
	Ca	24.18	24.56	24.94	25.31	25.69	26.07	26.45	26.83	27.21	27.59	27.97	28.35	28.72	29.10	29.48	29.86	30.24	30.62	31.00	31.38	31.76	32.14
58	Th	36.36	36.86	37.35	37.84	38.33	38.83	39.32	39.81	40.30	40.80	41.29	41.78	42.27	42.77	43.26	43.75	44.25	44.74	45.23	45.72	46.22	46.71
	Ca	23.71	24.09	24.46	24.84	25.22	25.60	25.98	26.36	26.74	27.12	27.50	27.88	28.25	28.63	29.01	29.39	29.77	30.15	30.53	30.91	31.29	31.66
56	Th	35.31	35.80	36.30	36.79	37.28	37.78	38.27	38.76	39.25	39.75	40.24	40.73	41.22	41.72	42.21	42.70	43.19	43.69	44.18	44.67	45.16	45.66
	Ca	23.24	23.62	23.99	24.37	24.75	25.13	25.51	25.89	26.27	26.65	27.03	27.40	27.78	28.16	28.54	28.92	29.30	29.68	30.06	30.44	30.61	31.19
54	Th	34.26	34.75	35.25	35.74	36.23	36.72	37.22	37.71	38.20	38.70	39.19	39.68	40.17	40.67	41.16	41.65	42.14	42.64	43.13	43.62	44.11	44.61
	Ca	22.77	23.14	23.52	23.90	24.28	24.66	25.04	25.42	25.80	26.18	26.55	26.93	27.31	27.69	28.07	28.45	28.83	29.21	29.59	29.96	30.34	30.72
52	Th	33.21	33.70	34.20	34.69	35.18	35.67	36.17	36.66	37.15	37.64	38.14	38.63	39.12	39.61	40.11	40.60	41.09	41.59	42.08	42.57	43.06	43.56
	Ca	22.29	22.67	23.05	23.43	23.81	24.19	24.57	24.95	25.33	25.70	26.08	26.46	26.84	27.22	27.60	27.98	28.36	28.74	29.12	29.49	29.87	30.25

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.246	0	.189
.1	.053	.299	.024	.213
.2	.105	.351	.047	.237
.3	.158	.404	.070	.260
.4	.210	.456	.094	.284
.5	.263	.509	.118	.307
.6	.315	.562	.141	.331
.7	.368	.614	.165	.354
.8	.420	.667	.188	.378
.9	.473	.719	.212	.401
1.0	.525	.772	.235	.425
1.1	.578	.824	.259	.448
1.2	.630	.877	.282	.472
1.3	.683	.929	.306	.495
1.4	.736	.982	.330	.519
1.5	.788	1.034	.353	.543
1.6	.841	1.087	.377	.566
1.7	.893	1.140	.400	.590
1.8	.946	1.192	.424	.613
1.9	.998	1.245	.447	.637

Table 129

Norms for Upper Arm and Forearm of Thirteen-Year-Old Girls (Upper arm = .2317 chest circumference + 2.2451 elbow - 6.7041; forearm = .0997 chest circumference + 2.0501 elbow + 2.3354)

Chest Circumference, Centimeters		Elbow Width, Centimeters													
		4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2
88	UA	24.01	24.46	24.91	25.36	25.81	26.26	26.71	27.16	27.61	28.05	28.50	28.95	29.40	29.85
	FA	20.54	20.95	21.36	21.77	22.18	22.59	23.00	23.41	23.82	24.23	24.64	25.05	25.46	25.87
86	UA	23.53	24.00	24.45	24.90	25.35	25.79	26.24	26.69	27.14	27.59	28.04	28.49	28.94	29.39
	FA	20.34	20.75	21.16	21.57	21.98	22.39	22.80	23.21	23.62	24.03	24.44	24.85	25.26	25.68
84	UA	23.09	23.54	23.98	24.43	24.88	25.33	25.78	26.23	26.68	27.13	27.58	28.03	28.47	28.92
	FA	20.14	20.55	20.96	21.37	21.78	22.19	22.60	23.01	23.42	23.83	24.24	24.65	25.06	25.47
82	UA	22.62	23.07	23.52	23.97	24.42	24.87	25.32	25.77	26.21	26.66	27.11	27.56	28.01	28.46
	FA	19.94	20.35	20.76	21.17	21.58	21.99	22.40	22.81	23.22	23.63	24.04	24.45	24.86	25.27
80	UA	22.16	22.61	23.06	23.51	23.96	24.40	24.85	25.30	25.75	26.20	26.65	27.10	27.55	28.00
	FA	19.74	20.15	20.56	20.97	21.38	21.79	22.20	22.61	23.02	23.43	23.84	24.25	24.66	25.07
78	UA	21.70	22.15	22.59	23.04	23.49	23.94	24.39	24.84	25.29	25.74	26.19	26.64	27.08	27.53
	FA	19.54	19.95	20.36	20.77	21.18	21.59	22.00	22.41	22.82	23.23	23.64	24.05	24.46	24.87
76	UA	21.23	21.68	22.13	22.58	23.03	23.48	23.93	24.38	24.82	25.27	25.72	26.17	26.62	27.07
	FA	19.34	19.75	20.16	20.57	20.98	21.39	21.80	22.21	22.62	23.03	23.44	23.85	24.26	24.67
74	UA	20.77	21.21	21.67	22.12	22.57	23.02	23.46	23.91	24.36	24.81	25.26	25.71	26.16	26.61
	FA	19.14	19.55	19.96	20.37	20.78	21.19	21.60	22.01	22.42	22.83	23.24	23.65	24.06	24.47
72	UA	20.31	20.76	21.20	21.65	22.10	22.55	23.00	23.45	23.90	24.35	24.80	25.25	25.70	26.14
	FA	18.94	19.35	19.76	20.17	20.58	20.99	21.40	21.81	22.22	22.63	23.04	23.45	23.86	24.27
70	UA	19.84	20.29	20.74	21.19	21.64	22.09	22.54	22.99	23.44	23.88	24.33	24.78	25.23	25.68
	FA	18.75	19.16	19.57	19.98	20.39	20.80	21.21	21.62	22.03	22.44	22.85	23.26	23.67	24.08
68	UA	19.38	19.83	20.28	20.73	21.18	21.63	22.07	22.52	22.97	23.42	23.87	24.32	24.77	25.22
	FA	18.55	18.96	19.37	19.78	20.19	20.60	21.01	21.42	21.83	22.24	22.65	23.06	23.47	23.88
66	UA	18.92	19.37	19.81	20.26	20.71	21.16	21.61	22.06	22.51	22.96	23.41	23.86	24.30	24.75
	FA	18.35	18.76	19.17	19.58	19.99	20.40	20.81	21.22	21.63	22.04	22.45	22.86	23.27	23.68
64	UA	18.45	18.90	19.35	19.80	20.25	20.70	21.15	21.60	22.05	22.49	22.94	23.39	23.84	24.29
	FA	18.15	18.55	18.97	19.38	19.79	20.20	20.61	21.02	21.43	21.84	22.25	22.66	23.07	23.48
62	UA	17.99	18.44	18.89	19.34	19.79	20.23	20.68	21.13	21.58	22.03	22.48	22.93	23.38	23.83
	FA	17.95	18.36	18.77	19.18	19.59	20.00	20.41	20.82	21.23	21.64	22.05	22.46	22.87	23.28
60	UA	17.53	17.98	18.42	18.87	19.32	19.77	20.22	20.67	21.12	21.57	22.02	22.47	22.91	23.36
	FA	17.75	18.16	18.57	18.98	19.39	19.80	20.21	20.62	21.03	21.44	21.85	22.26	22.67	23.08
58	UA	17.06	17.51	17.96	18.41	18.86	19.31	19.76	20.21	20.66	21.10	21.55	22.00	22.45	22.90
	FA	17.55	17.96	18.37	18.78	19.19	19.60	20.01	20.42	20.83	21.24	21.65	22.06	22.47	22.88
56	UA	16.60	17.05	17.50	17.95	18.40	18.84	19.29	19.74	20.19	20.64	21.09	21.54	21.99	22.44
	FA	17.35	17.76	18.17	18.58	18.99	19.40	19.81	20.22	20.63	21.04	21.45	21.86	22.27	22.68
54	UA	16.14	16.59	17.03	17.48	17.93	18.38	18.83	19.28	19.73	20.18	20.63	21.07	21.52	21.97
	FA	17.15	17.56	17.97	18.38	18.79	19.20	19.61	20.02	20.43	20.84	21.25	21.66	22.07	22.48
52	UA	15.67	16.12	16.57	17.02	17.47	17.92	18.37	18.81	19.26	19.71	20.16	20.61	21.06	21.51
	FA	16.95	17.36	17.77	18.18	18.59	19.00	19.41	19.82	20.23	20.64	21.05	21.46	21.87	22.28

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.225	0	.205
.1	.023	.248	.010	.215
.2	.046	.271	.020	.225
.3	.070	.294	.030	.235
.4	.093	.317	.040	.245
.5	.116	.340	.050	.255
.6	.139	.363	.060	.265
.7	.162	.387	.070	.275
.8	.185	.410	.080	.285
.9	.209	.433	.090	.295
1.0	.232	.456	.100	.305
1.1	.255	.479	.110	.315
1.2	.278	.503	.120	.325
1.3	.301	.526	.130	.335
1.4	.324	.549	.140	.345
1.5	.348	.572	.150	.355
1.6	.371	.595	.160	.365
1.7	.394	.618	.170	.375
1.8	.417	.642	.180	.384
1.9	.440	.665	.190	.394

Table 130

Norms for Thigh and Calf of Thirteen-Year-Old Girls (Thigh = .3357 chest circumference + 3.7625 knee - 7.9668; calf = .1687 chest circumference + 2.2830 knee - .7315)

Chest Circumference, Centimeters		Knee Width, Centimeters																						
		7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6
88	Th	48.66	49.42	50.17	50.92	51.67	52.43	53.18	53.93	54.68	55.44	56.19	56.94	57.69	58.45	59.20	59.95	60.70	61.46	62.21	62.96	63.71	64.47	65.22
	Ca	30.55	31.01	31.46	31.92	32.38	32.83	33.29	33.75	34.20	34.66	35.12	35.57	36.03	36.49	36.94	37.40	37.86	38.31	38.77	39.23	39.68	40.14	40.60
86	Th	47.99	48.75	49.50	50.25	51.00	51.76	52.51	53.26	54.01	54.77	55.52	56.27	57.02	57.78	58.53	59.28	60.03	60.79	61.54	62.29	63.04	63.80	64.55
	Ca	30.21	30.67	31.13	31.58	32.04	32.50	32.95	33.41	33.87	34.32	34.78	35.24	35.69	36.15	36.61	37.06	37.52	37.98	38.43	38.89	39.35	39.80	40.26
84	Th	47.32	48.07	48.83	49.58	50.33	51.08	51.84	52.59	53.34	54.09	54.85	55.60	56.35	57.10	57.86	58.61	59.36	60.11	60.87	61.62	62.37	63.12	63.98
	Ca	29.88	30.33	30.79	31.25	31.70	32.16	32.61	33.07	33.53	33.99	34.44	34.90	35.36	35.81	36.27	36.73	37.18	37.64	38.10	38.55	39.01	39.47	39.92
82	Th	46.65	47.40	48.16	48.91	49.66	50.41	51.17	51.92	52.67	53.42	54.18	54.93	55.68	56.43	57.19	57.94	58.69	59.44	60.20	60.95	61.70	62.45	63.21
	Ca	29.54	30.00	30.45	30.91	31.37	31.82	32.28	32.74	33.19	33.65	34.11	34.56	35.02	35.48	35.93	36.39	36.85	37.30	37.76	38.21	38.67	39.13	39.58
80	Th	45.98	46.73	47.48	48.24	48.99	49.74	50.49	51.25	52.00	52.75	53.50	54.26	55.01	55.76	56.51	57.27	58.02	58.77	59.52	60.28	61.03	61.78	62.53
	Ca	29.20	29.66	30.12	30.57	31.03	31.49	31.94	32.40	32.85	33.31	33.77	34.22	34.68	35.14	35.59	36.05	36.51	36.96	37.42	37.88	38.33	38.79	39.25
78	Th	45.31	46.06	46.81	47.57	48.32	49.07	49.82	50.58	51.33	52.08	52.83	53.59	54.34	55.09	55.84	56.60	57.35	58.10	58.85	59.61	60.36	61.11	61.86
	Ca	28.86	29.32	29.78	30.23	30.69	31.15	31.60	32.06	32.52	32.97	33.43	33.89	34.34	34.80	35.26	35.71	36.17	36.63	37.08	37.54	38.00	38.45	38.91
76	Th	44.64	45.39	46.14	46.89	47.64	48.40	49.15	49.90	50.66	51.41	52.16	52.91	53.67	54.42	55.17	55.92	56.68	57.43	58.18	58.93	59.69	60.44	61.19
	Ca	28.53	28.98	29.44	29.90	30.35	30.81	31.27	31.72	32.18	32.64	33.09	33.55	34.01	34.46	34.92	35.38	35.83	36.29	36.75	37.20	37.66	38.12	38.57
74	Th	43.97	44.72	45.47	46.22	46.98	47.73	48.48	49.23	49.99	50.74	51.49	52.24	53.00	53.75	54.50	55.25	56.01	56.76	57.51	58.26	59.02	59.77	60.52
	Ca	28.19	28.65	29.10	29.56	30.02	30.47	30.93	31.39	31.84	32.30	32.76	33.21	33.67	34.13	34.58	35.04	35.50	35.95	36.41	36.87	37.32	37.78	38.24
72	Th	43.29	44.05	44.80	45.55	46.30	47.06	47.81	48.56	49.31	50.07	50.82	51.57	52.32	53.08	53.83	54.58	55.33	56.09	56.84	57.59	58.34	59.10	59.85
	Ca	27.85	28.31	28.77	29.22	29.68	30.14	30.59	31.05	31.51	31.96	32.42	32.88	33.33	33.79	34.24	34.70	35.16	35.61	36.07	36.53	36.98	37.44	37.90
70	Th	42.62	43.37	44.13	44.88	45.63	46.38	47.14	47.89	48.64	49.39	50.15	50.90	51.65	52.40	53.16	53.91	54.66	55.41	56.17	56.92	57.67	58.42	59.18
	Ca	27.52	27.97	28.43	28.88	29.34	29.80	30.25	30.71	31.17	31.62	32.08	32.54	32.99	33.45	33.91	34.36	34.82	35.28	35.73	36.19	36.65	37.10	37.56
68	Th	41.95	42.70	43.46	44.21	44.96	45.71	46.47	47.22	47.97	48.72	49.48	50.23	50.98	51.73	52.49	53.24	53.99	54.74	55.50	56.25	57.00	57.75	58.51
	Ca	27.18	27.63	28.09	28.55	29.00	29.46	29.92	30.37	30.83	31.29	31.74	32.20	32.66	33.11	33.57	34.03	34.48	34.94	35.40	35.85	36.31	36.77	37.22
66	Th	41.28	42.03	42.78	43.54	44.29	45.04	45.79	46.55	47.30	48.05	48.80	49.56	50.31	51.06	51.81	52.57	53.32	54.07	54.82	55.58	56.33	57.08	57.83
	Ca	26.84	27.30	27.75	28.21	28.67	29.12	29.58	30.03	30.49	30.95	31.41	31.86	32.32	32.78	33.23	33.69	34.15	34.60	35.06	35.52	35.95	36.43	36.89
64	Th	40.61	41.36	42.11	42.87	43.62	44.37	45.12	45.88	46.63	47.38	48.13	48.89	49.64	50.39	51.14	51.90	52.65	53.40	54.15	54.91	55.66	56.41	57.16
	Ca	26.50	26.96	27.42	27.87	28.33	28.79	29.24	29.70	30.16	30.61	31.07	31.53	31.98	32.44	32.90	33.35	33.81	34.27	34.72	35.18	35.63	36.09	36.55
62	Th	39.94	40.69	41.44	42.19	42.95	43.70	44.45	45.20	45.96	46.71	47.46	48.21	48.97	49.72	50.47	51.22	51.98	52.73	53.48	54.23	54.99	55.74	56.49
	Ca	26.17	26.66	27.08	27.54	27.99	28.45	28.91	29.36	29.82	30.27	30.73	31.19	31.64	32.10	32.56	33.01	33.47	33.93	34.38	34.84	35.30	35.75	36.21
60	Th	39.27	40.02	40.77	41.52	42.28	43.03	43.78	44.53	45.29	46.04	46.79	47.54	48.30	49.05	49.80	50.55	51.31	52.06	52.81	53.56	54.32	55.07	55.82
	Ca	25.83	26.28	26.74	27.20	27.65	28.11	28.57	29.02	29.48	29.94	30.39	30.85	31.31	31.76	32.22	32.68	33.13	33.59	34.04	34.50	34.96	35.42	35.87
58	Th	38.59	39.35	40.10	40.85	41.60	42.36	43.11	43.86	44.61	44.37	45.12	45.87	47.62	48.38	49.13	49.88	50.63	51.39	52.14	52.89	53.64	54.40	55.15
	Ca	25.49	25.95	26.40	26.86	27.32	27.77	28.23	28.68	29.14	29.60	30.06	30.51	30.97	31.43	31.88	32.34	32.90	33.25	33.71	34.17	34.62	35.08	35.54
56	Th	37.92	38.67	39.43	40.18	40.93	41.68	42.44	43.19	43.94	44.69	45.45	46.20	46.95	47.70	48.46	49.21	49.96	50.71	51.47	52.22	52.97	53.72	54.48
	Ca	25.15	25.61	26.07	26.52	26.98	27.44	27.89	28.35	28.81	29.26	29.72	30.18	30.63	31.09	31.55	32.00	32.46	32.92	33.37	33.33	34.29	34.74	35.20
54	Th	37.25	38.00	38.76	39.51	40.26	41.01	41.77	42.52	43.27	44.02	44.79	45.53	46.28	47.03	47.79	48.54	49.29	50.04	50.80	51.55	52.30	53.05	53.81
	Ca	24.82	25.27	25.73	26.19	26.64	27.10	27.56	28.01	28.47	28.93	29.38	29.84	30.30	30.75	31.21	31.66	32.12	32.58	33.03	33.49	33.95	34.40	34.86
52	Th	36.58	37.33	38.08	38.84	39.59	40.34	41.09	41.85	42.60	43.35	44.10	44.86	45.61	46.36	47.11	47.97	48.62	49.37	50.12	50.89	51.63	52.38	53.13
	Ca	24.48	24.94	25.39	25.85	26.30	26.76	27.22	27.67	28.13	28.59	29.04	29.50	29.96	30.41	30.87	31.33	31.78	32.24	32.70	33.15	33.61	34.07	34.52

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.376	0	.228
.1	.034	.410	.017	.245
.2	.067	.443	.034	.262
.3	.100	.477	.051	.279
.4	.134	.511	.067	.296
.5	.168	.544	.084	.313
.6	.201	.578	.101	.330
.7	.235	.611	.118	.346
.8	.269	.645	.135	.363
.9	.302	.678	.152	.380
1.0	.336	.712	.169	.397
1.1	.369	.746	.186	.414
1.2	.403	.779	.202	.431
1.3	.436	.813	.219	.448
1.4	.470	.846	.236	.464
1.5	.504	.880	.253	.481
1.6	.537	.913	.270	.498
1.7	.571	.947	.287	.515
1.8	.604	.981	.304	.532
1.9	.638	1.014	.321	.549

Table 131

Norms for Upper Arm and Forearm of Fourteen-Year-Old Girls (Upper arm = .2396 chest circumference + 2.3388 elbow - 7.5937; forearm = .0997 chest circumference + 2.1718 elbow + 1.9171)

Chest Circumference, Centimeters		Elbow Width, Centimeters												
		4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2
90	UA	25.20	25.66	26.13	26.60	27.07	27.54	28.00	28.47	28.94	29.41	29.87	30.34	30.81
	FA	21.31	21.75	22.18	22.62	23.05	23.49	23.92	24.36	24.79	25.22	25.66	26.09	26.53
88	UA	24.72	25.19	25.65	26.12	26.59	27.06	27.25	27.99	28.46	28.93	29.39	29.86	30.33
	FA	21.12	21.55	21.98	22.42	22.85	23.29	23.72	24.16	24.59	25.02	25.46	25.89	26.33
86	UA	24.24	24.71	25.17	25.64	26.11	26.58	27.04	27.51	27.98	28.45	28.92	29.38	29.85
	FA	20.92	21.35	21.78	22.22	22.65	23.09	23.52	23.96	24.39	24.83	25.26	25.69	26.13
84	UA	23.76	24.23	24.69	25.16	25.63	26.10	26.57	27.03	27.50	27.97	28.44	28.90	29.37
	FA	20.72	21.15	21.59	22.02	22.45	22.89	23.32	23.76	24.19	24.63	25.06	25.59	25.93
82	UA	23.28	23.75	24.22	24.68	25.15	25.62	26.09	26.53	27.02	27.49	27.96	28.43	28.89
	FA	20.52	20.95	21.39	21.82	22.25	22.69	23.12	23.56	23.99	24.43	24.86	25.30	25.73
80	UA	22.80	23.27	23.74	24.20	24.67	25.14	25.61	26.07	26.54	27.01	27.48	27.95	28.41
	FA	20.32	20.75	21.19	21.62	22.06	22.49	22.92	23.36	23.79	24.23	24.66	25.10	25.53
78	UA	22.32	22.79	23.26	23.72	24.19	24.66	25.13	25.60	26.06	26.53	27.00	27.47	27.93
	FA	20.12	20.55	20.99	21.42	21.86	22.29	22.72	23.16	23.59	24.03	24.46	24.90	25.33
76	UA	21.84	22.31	22.78	23.25	23.71	24.18	24.65	25.12	25.58	26.05	26.52	26.99	27.46
	FA	19.92	20.35	20.79	21.22	21.66	22.09	22.53	22.96	23.39	23.83	24.26	24.70	25.13
74	UA	21.36	21.83	22.30	22.77	23.23	23.70	24.17	24.64	25.11	25.57	26.04	26.51	26.98
	FA	19.72	20.15	20.59	21.02	21.46	21.89	22.33	22.76	23.19	23.63	24.06	24.50	24.93
72	UA	20.88	21.35	21.82	22.29	22.75	23.22	23.69	24.16	24.63	25.09	25.56	26.03	26.50
	FA	19.52	19.95	20.39	20.82	21.26	21.69	22.13	22.56	23.00	23.43	23.86	24.30	24.73
70	UA	20.40	20.87	21.34	21.81	22.28	22.74	23.21	23.68	24.15	24.61	25.08	25.55	26.02
	FA	19.32	19.76	20.19	20.63	21.06	21.49	21.93	22.36	22.80	23.23	23.66	24.10	24.53
68	UA	19.93	20.39	20.86	21.33	21.80	22.26	22.73	23.20	23.67	24.14	24.60	25.07	25.54
	FA	19.12	19.56	19.99	20.42	20.86	21.29	21.73	22.16	22.60	23.03	23.46	23.90	24.33
66	UA	19.45	19.91	20.38	20.85	21.32	21.78	22.25	22.72	23.19	23.66	24.12	24.59	25.06
	FA	18.92	19.36	19.79	20.23	20.66	21.09	21.53	21.96	22.40	22.83	23.27	23.70	24.13
64	UA	18.97	19.43	19.90	20.37	20.84	21.31	21.77	22.24	22.71	23.17	23.64	24.11	24.58
	FA	18.72	19.16	19.59	20.03	20.46	20.89	21.33	21.76	22.20	22.63	23.07	23.50	23.93
62	UA	18.49	18.96	19.42	19.89	20.36	20.83	21.29	21.76	22.23	22.70	23.17	23.63	24.10
	FA	18.52	18.96	19.39	19.83	20.26	20.69	21.13	21.56	22.00	22.43	22.87	23.30	23.74
60	UA	18.01	18.48	18.94	19.41	19.88	20.35	20.82	21.28	21.75	22.22	22.69	23.15	23.62
	FA	18.32	18.76	19.19	19.63	20.06	20.50	20.93	21.36	21.80	22.23	22.67	23.10	23.54
58	UA	17.53	18.00	18.46	18.93	19.40	19.87	20.34	20.80	21.27	21.74	22.21	22.67	23.14
	FA	18.12	18.56	18.99	19.43	19.86	20.30	20.73	21.16	21.60	22.03	22.47	22.90	23.34
56	UA	17.05	17.52	17.99	18.45	18.92	19.39	19.86	20.32	20.79	21.26	21.73	22.20	22.66
	FA	17.92	18.36	18.79	19.23	19.66	20.10	20.53	20.97	21.40	21.82	22.27	22.70	23.14
54	UA	16.57	17.04	17.51	17.97	18.44	18.91	19.38	19.85	20.31	20.78	21.25	21.72	22.18
	FA	17.73	18.16	18.59	19.03	19.46	19.90	20.33	20.77	21.20	21.63	22.07	22.50	22.94
52	UA	16.09	16.56	17.03	17.50	17.96	18.43	18.90	19.37	19.83	20.30	20.77	21.24	21.70
	FA	17.53	17.96	18.39	18.83	19.26	19.70	20.13	20.57	21.00	21.44	21.87	22.30	22.74

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.234	0	.217
.1	.024	.258	.010	.227
.2	.048	.282	.020	.237
.3	.072	.306	.030	.247
.4	.096	.330	.040	.257
.5	.120	.354	.050	.267
.6	.144	.378	.060	.277
.7	.168	.402	.070	.287
.8	.192	.426	.080	.297
.9	.216	.450	.090	.307
1.0	.240	.473	.100	.317
1.1	.264	.497	.110	.327
1.2	.288	.521	.120	.337
1.3	.311	.545	.130	.347
1.4	.335	.569	.140	.357
1.5	.359	.593	.150	.367
1.6	.383	.617	.160	.377
1.7	.407	.641	.169	.387
1.8	.431	.665	.179	.397
1.9	.455	.689	.189	.407

Table 132

Norms for Thigh and Calf of Fourteen-Year-Old Girls (Thigh = .4007 chest circumference + 3.2402 knee - 6.8393; calf = .1887 chest circumference + 1.3757 knee + 6.3055)

Chest Circumference, Centimeters		Knee Width, Centimeters																					
		7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.9	10.0	10.2	10.4	10.6	10.8	11.0	11.2
90	Th	51.91	52.56	53.20	53.85	54.50	55.15	55.79	56.44	57.09	57.74	58.39	59.03	59.68	60.33	60.98	61.63	62.27	62.92	63.57	64.22	64.87	65.51
	Ca	32.92	33.19	33.47	33.74	34.02	34.29	34.57	34.84	35.11	35.39	35.67	35.94	36.22	36.50	36.77	37.04	37.32	37.60	37.87	38.15	38.42	38.70
88	Th	51.10	51.75	52.40	53.05	53.70	54.34	54.99	55.65	56.29	56.94	57.58	58.23	58.88	59.53	60.18	60.82	61.47	62.12	62.77	63.42	64.06	64.71
	Ca	32.54	32.92	33.09	33.37	33.64	33.92	34.19	34.47	34.74	35.02	35.29	35.57	35.84	36.12	36.39	36.57	36.94	37.22	37.49	37.77	38.04	38.32
86	Th	50.30	50.95	51.60	52.25	52.99	53.54	54.19	54.84	55.49	56.13	56.78	57.43	58.08	58.73	59.37	60.02	60.67	61.32	61.97	62.62	63.26	63.91
	Ca	32.16	32.44	32.71	32.99	33.26	33.54	33.81	34.09	34.36	34.64	34.92	35.19	35.47	35.74	36.02	36.29	36.57	36.84	37.12	37.39	37.67	37.94
84	Th	49.50	50.15	50.80	51.45	52.09	52.74	53.39	54.04	54.69	55.33	55.98	56.62	57.28	57.93	58.57	59.22	59.87	60.52	61.17	61.81	62.46	63.11
	Ca	31.79	32.06	32.34	32.61	32.89	33.16	33.44	33.71	33.99	34.26	34.54	34.81	35.09	35.36	35.64	35.91	36.19	36.46	36.74	37.01	37.29	37.56
82	Th	48.70	49.35	50.00	50.64	51.29	51.94	52.59	53.24	53.88	54.53	55.18	55.93	56.48	57.12	57.77	58.42	59.07	59.72	60.36	61.01	61.66	62.31
	Ca	31.41	31.68	31.96	32.23	32.51	32.78	33.06	33.33	33.61	33.89	34.16	34.44	34.71	34.99	35.26	35.54	35.31	36.09	36.36	36.64	36.91	37.19
80	Th	47.90	48.55	49.19	49.84	50.49	51.14	51.79	52.43	53.08	53.73	54.39	55.03	55.67	56.32	56.97	57.97	58.27	58.91	59.56	60.21	60.86	61.51
	Ca	31.03	31.31	31.58	31.96	32.13	32.41	32.68	32.96	33.23	33.51	33.78	34.06	34.33	34.61	34.98	35.16	35.43	35.71	35.98	36.26	36.53	36.31
78	Th	47.10	47.74	48.39	49.04	49.67	50.34	50.98	51.63	52.28	52.93	53.58	54.23	54.87	55.52	56.17	56.82	57.47	58.11	58.76	59.41	60.06	60.71
	Ca	30.65	30.93	31.20	31.48	31.75	32.03	32.30	32.58	32.86	33.13	33.41	33.68	33.96	34.23	34.51	34.78	35.06	35.33	35.61	35.98	36.16	36.43
76	Th	46.30	46.94	47.59	48.24	48.89	49.54	50.18	50.93	51.48	52.13	52.78	53.42	54.07	54.72	55.37	56.02	56.66	57.31	57.96	58.61	59.26	59.90
	Ca	30.28	30.55	30.83	31.10	31.38	31.65	31.93	32.20	32.48	32.75	33.03	33.30	33.58	33.85	34.13	34.40	34.68	34.95	35.23	35.50	35.78	36.05
74	Th	45.49	46.14	46.79	47.44	48.09	48.73	49.38	50.03	50.68	51.33	51.97	52.62	53.27	53.92	54.57	55.21	55.86	56.51	57.16	57.81	58.45	59.10
	Ca	29.90	30.17	30.45	30.72	31.00	31.27	31.55	31.83	32.10	32.38	32.65	32.93	33.20	33.48	33.75	34.03	34.30	34.58	34.85	35.13	35.40	35.68
72	Th	44.69	45.34	45.99	46.64	47.28	47.93	48.58	49.23	49.38	50.52	51.17	51.82	52.47	53.12	53.77	54.41	55.06	55.71	56.36	57.01	57.65	58.30
	Ca	29.52	29.80	30.07	30.35	30.62	30.90	31.17	31.45	31.72	32.00	32.27	32.55	32.82	33.10	33.37	33.65	33.92	34.20	34.47	34.75	35.02	35.30
70	Th	43.39	44.54	45.19	45.94	46.48	47.13	47.78	48.43	49.08	49.72	50.37	51.02	51.67	52.32	52.96	53.61	54.26	55.91	55.56	56.20	56.85	57.50
	Ca	29.14	29.42	29.69	29.97	30.24	30.52	30.80	31.07	31.35	31.62	31.90	32.17	32.45	32.72	33.00	33.27	33.55	33.82	34.10	34.37	34.65	34.92
68	Th	43.09	44.74	45.39	46.03	46.68	46.33	46.98	47.63	48.27	48.92	49.57	50.22	50.87	51.51	52.16	52.81	53.46	54.11	54.75	55.40	56.05	56.70
	Ca	28.77	29.04	29.32	29.59	29.97	30.14	30.42	30.69	30.97	31.24	31.52	31.79	32.07	32.34	32.62	32.99	33.17	33.44	33.72	33.99	34.27	34.54
66	Th	42.29	42.94	43.58	44.23	44.98	45.53	46.18	46.82	47.47	48.12	48.77	49.42	50.06	50.71	51.36	52.01	52.66	53.30	53.95	54.60	55.25	55.90
	Ca	28.39	28.66	28.94	29.22	29.49	29.77	30.04	30.32	30.59	30.87	31.14	31.42	31.69	31.97	32.24	32.52	32.79	33.07	33.34	33.62	33.89	34.17
64	Th	41.49	42.13	42.78	43.43	44.08	44.73	45.38	46.02	46.67	47.32	47.97	48.62	49.26	49.91	50.56	51.21	51.96	52.50	53.15	53.90	54.45	55.10
	Ca	28.01	28.29	28.56	28.94	29.11	29.39	29.66	29.94	30.21	30.49	30.76	31.04	31.31	31.59	31.96	32.14	32.41	32.69	32.96	33.24	33.52	33.79
62	Th	40.69	41.33	41.98	42.63	43.28	43.93	44.57	45.22	45.87	46.52	47.17	47.81	48.46	49.11	49.76	50.41	51.05	51.70	52.35	53.00	53.65	54.29
	Ca	27.63	27.91	28.19	28.46	28.74	29.01	29.29	29.56	29.94	30.11	30.39	30.56	30.94	31.21	31.49	31.76	32.04	32.31	32.59	32.86	33.14	33.41
60	Th	39.88	40.53	41.18	41.83	42.48	43.12	43.77	44.42	45.07	45.72	46.36	47.01	47.66	48.31	48.96	49.60	50.25	50.90	51.55	52.20	52.94	53.49
	Ca	27.26	27.53	27.91	28.08	28.36	28.63	28.91	29.18	29.46	29.73	30.01	30.28	30.56	30.83	31.11	31.38	31.66	31.93	32.21	32.49	32.76	33.04
58	Th	39.08	39.73	40.38	41.03	41.67	42.32	42.97	43.62	44.27	44.92	45.56	46.21	46.86	47.51	48.16	48.80	49.45	50.10	50.75	51.40	52.04	52.69
	Ca	26.98	27.16	27.43	27.71	27.98	28.26	28.53	28.91	29.08	29.36	29.63	29.91	30.18	30.46	30.73	31.01	31.28	31.56	31.93	32.11	32.38	32.56
56	Th	38.28	38.93	39.58	40.23	40.87	41.62	42.17	42.82	43.47	44.11	44.76	45.41	46.06	46.71	47.35	48.00	48.65	49.30	49.95	50.59	51.24	51.99
	Ca	26.50	26.78	27.05	27.33	27.60	27.89	28.15	28.43	28.70	28.98	29.25	29.53	29.80	30.08	30.35	30.63	30.90	31.18	31.46	31.73	32.01	32.28
54	Th	37.48	38.13	38.78	39.42	40.07	40.72	41.37	42.01	42.66	43.31	43.96	44.51	45.26	45.90	46.55	47.20	47.85	48.50	49.14	49.79	50.44	51.09
	Ca	26.13	26.40	26.68	26.95	27.23	27.50	27.78	28.05	28.33	28.50	28.88	29.15	29.43	29.70	29.98	30.25	30.53	30.80	31.08	31.35	31.53	31.90
52	Th	36.68	37.33	37.97	38.62	39.27	39.92	40.57	41.21	41.86	42.51	43.16	43.31	44.45	45.10	45.75	46.40	47.05	47.70	48.34	48.99	49.64	50.29
	Ca	25.75	26.02	26.30	26.57	26.95	27.12	27.40	27.67	27.95	28.22	28.50	28.77	29.05	29.32	29.60	29.97	30.15	30.43	30.70	30.98	31.25	31.53

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	.000	.324	0	.138
.1	.040	.364	.019	.156
.2	.080	.404	.038	.175
.3	.120	.444	.057	.194
.4	.160	.484	.075	.213
.5	.200	.524	.094	.232
.6	.240	.564	.113	.251
.7	.280	.605	.132	.270
.8	.321	.645	.151	.289
.9	.361	.685	.170	.307
1.0	.401	.725	.189	.326
1.1	.441	.765	.208	.345
1.2	.481	.805	.226	.364
1.3	.521	.845	.245	.383
1.4	.561	.885	.264	.402
1.5	.601	.925	.283	.421
1.6	.641	.965	.302	.439
1.7	.681	1.005	.321	.458
1.8	.721	1.045	.340	.477
1.9	.761	1.085	.359	.496

Table 133

Norms for Upper Arm and Forearm of Fifteen-Year-Old Girls (Upper arm = .2241 chest circumference + 1.6513 elbow - 1.9860; forearm = .1010 chest circumference + 1.9357 elbow + 3.4996)

Chest Circumference, Centimeters		Elbow Width, Centimeters													
		4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4
88	UA	25.66	25.99	26.32	26.65	26.98	27.31	27.64	27.97	28.30	28.63	28.96	29.29	29.62	29.95
	FA	21.68	22.07	22.45	22.84	23.23	23.61	24.00	24.39	24.78	25.16	25.55	25.94	26.32	26.71
86	UA	25.21	25.54	25.87	26.20	26.53	26.86	27.19	27.52	27.85	28.19	28.52	28.85	29.18	29.51
	FA	21.48	21.86	22.25	22.64	23.03	23.41	23.80	24.19	24.57	24.96	25.35	25.74	26.12	26.51
84	UA	24.76	25.09	25.43	25.76	26.09	26.42	26.75	27.08	27.41	27.74	28.07	28.40	28.73	29.06
	FA	21.27	21.66	22.05	22.44	22.82	23.21	23.60	23.98	24.37	24.76	25.15	25.53	25.92	26.31
82	UA	24.32	24.65	24.98	25.31	25.64	25.97	26.30	26.63	26.96	27.29	27.62	27.95	28.28	28.61
	FA	21.07	21.46	21.85	22.23	22.62	23.01	23.40	23.78	24.17	24.56	24.94	25.33	25.72	26.11
80	UA	23.87	24.20	24.53	24.86	25.19	25.52	25.85	26.18	26.51	26.84	27.17	27.50	27.83	28.16
	FA	20.87	21.26	21.65	22.03	22.42	22.81	23.19	23.58	23.97	24.36	24.74	25.13	25.51	25.90
78	UA	23.42	23.75	24.08	24.41	24.74	25.07	25.40	25.73	26.06	26.39	26.72	27.05	27.38	27.71
	FA	20.67	21.06	21.44	21.83	22.22	22.60	22.99	23.38	23.77	24.15	24.54	24.93	25.31	25.70
76	UA	22.97	23.30	23.63	23.96	24.29	24.62	24.95	25.28	25.61	25.94	26.27	26.60	26.93	27.27
	FA	20.47	20.85	21.24	21.63	22.02	22.40	22.79	23.18	23.56	23.95	24.34	24.73	25.11	25.50
74	UA	22.52	22.85	23.18	23.51	23.84	24.17	24.51	24.84	25.17	25.50	25.83	26.16	26.49	26.82
	FA	20.26	20.65	21.04	21.43	21.81	22.20	22.59	22.97	23.36	23.75	24.14	24.52	24.91	25.30
72	UA	22.08	22.41	22.74	23.07	23.40	23.73	24.06	24.39	24.72	25.05	25.38	25.71	26.04	26.37
	FA	20.06	20.45	20.84	21.22	21.61	22.00	22.39	22.77	23.16	23.55	23.93	24.32	24.71	25.10
70	UA	21.63	21.96	22.29	22.62	22.95	23.28	23.61	23.94	24.27	24.60	24.93	25.26	25.59	25.92
	FA	19.86	20.25	20.64	21.02	21.41	21.80	22.18	22.57	22.96	23.35	23.73	24.12	24.51	24.89
68	UA	21.18	21.51	21.84	22.17	22.50	22.83	23.16	23.49	23.82	24.15	24.48	24.81	25.14	25.47
	FA	19.66	20.05	20.43	20.82	21.21	21.59	21.98	22.37	22.76	23.14	23.53	23.92	24.30	24.69
66	UA	20.73	21.06	21.39	21.72	22.05	22.38	22.71	23.04	23.37	23.70	24.03	24.36	24.69	25.02
	FA	19.46	19.84	20.23	20.62	21.01	21.39	21.78	22.17	22.55	22.94	23.33	23.72	24.10	24.49
64	UA	20.28	20.61	20.94	21.27	21.60	21.93	22.26	22.59	22.92	23.25	23.59	23.92	24.25	24.58
	FA	19.25	19.64	20.03	20.42	20.80	21.19	21.58	21.96	22.35	22.74	23.13	23.51	23.90	24.29
62	UA	19.83	20.16	20.49	20.83	21.16	21.49	21.82	22.15	22.48	22.81	23.14	23.47	23.80	24.13
	FA	19.05	19.44	19.83	20.21	20.60	20.99	21.38	21.76	22.15	22.54	22.92	23.31	23.70	24.09
60	UA	19.39	19.72	20.05	20.38	20.71	21.04	21.37	21.70	22.03	22.36	22.69	23.02	23.35	23.68
	FA	18.85	19.24	19.63	20.01	20.40	20.79	21.17	21.56	21.95	22.34	22.72	23.11	23.50	23.88
58	UA	18.94	19.27	19.60	19.93	20.26	20.59	20.92	21.25	21.58	21.91	22.24	22.57	22.90	23.23
	FA	18.65	19.04	19.42	19.81	20.20	20.58	20.97	21.36	21.75	22.13	22.52	22.91	23.29	23.68
56	UA	18.49	18.82	19.15	19.48	19.81	20.14	20.47	20.80	21.13	21.46	21.79	22.12	22.45	22.78
	FA	18.45	18.83	19.22	19.61	20.00	20.38	20.77	21.16	21.54	21.93	22.32	22.71	23.09	23.48
54	UA	18.04	18.37	18.70	19.03	19.36	19.69	20.02	20.35	20.68	21.01	21.34	21.67	22.00	22.34
	FA	18.24	18.63	19.02	19.41	19.79	20.18	20.57	20.95	21.34	21.73	22.12	22.50	22.89	23.28

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.165	0	.194
.1	.022	.188	.010	.204
.2	.045	.210	.020	.214
.3	.067	.232	.030	.224
.4	.090	.255	.040	.234
.5	.112	.277	.051	.244
.6	.134	.300	.061	.254
.7	.157	.322	.071	.264
.8	.179	.344	.081	.274
.9	.202	.367	.091	.284
1.0	.224	.389	.101	.295
1.1	.247	.412	.111	.305
1.2	.269	.434	.121	.315
1.3	.291	.456	.131	.325
1.4	.314	.479	.141	.335
1.5	.336	.501	.152	.345
1.6	.359	.524	.162	.355
1.7	.381	.546	.172	.365
1.8	.403	.569	.182	.375
1.9	.426	.591	.192	.385

Table 136

Norms for Thigh and Calf of Fifteen-Year-Old Girls (Thigh = .3167 chest circumference + 3.7123 knee − 4.6443; calf = .1315 chest circumference + 2.1371 knee + 3.8509)

Chest Circumference, Centimeters		Knee Width, Centimeters																						
		7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6
88	Th	49.95	50.70	51.44	52.18	52.92	53.67	54.41	55.15	55.89	56.64	57.38	58.12	58.86	59.61	60.35	61.09	61.83	62.58	63.32	64.06	64.80	65.55	66.29
	Ca	30.81	31.24	31.66	32.09	32.52	32.95	33.37	33.80	34.23	34.66	35.08	35.51	35.94	36.37	36.79	37.22	37.65	38.08	38.50	38.93	39.36	39.79	40.21
86	Th	49.32	50.06	50.81	51.55	52.29	53.03	53.78	54.52	55.26	56.00	56.75	57.49	58.23	58.97	59.71	60.46	61.20	61.94	62.68	63.43	64.17	64.91	65.65
	Ca	30.55	30.97	31.40	31.83	32.26	32.68	33.11	33.54	33.97	34.39	34.82	35.25	35.68	36.10	36.53	36.96	37.39	37.81	38.24	38.67	39.10	39.52	39.95
84	Th	48.69	49.43	50.17	50.91	51.66	52.40	53.14	53.88	54.63	55.37	56.11	56.85	57.60	58.34	59.08	59.82	60.57	61.31	62.05	62.79	63.54	64.28	65.02
	Ca	30.28	30.71	31.14	31.57	31.99	32.42	32.85	33.28	33.70	34.13	34.56	34.99	35.41	35.84	36.27	36.70	37.12	37.55	37.98	38.41	38.83	39.26	39.69
82	Th	48.05	48.80	49.54	50.28	51.02	51.77	52.51	53.25	53.99	54.74	55.48	56.22	56.96	57.71	58.45	59.19	59.93	60.68	61.42	62.16	62.90	63.65	64.39
	Ca	30.02	30.45	30.88	31.30	31.73	32.16	32.59	33.01	33.44	33.87	34.30	34.72	35.15	35.58	36.00	36.43	36.86	37.29	37.71	38.14	38.57	39.00	39.42
80	Th	47.42	48.16	48.91	49.65	50.39	51.13	51.88	52.62	53.36	54.10	54.84	55.59	56.33	57.07	57.81	58.56	59.30	60.04	60.78	61.53	62.27	63.01	63.75
	Ca	29.76	30.19	30.61	31.04	31.47	31.90	32.32	32.75	33.18	33.60	34.03	34.46	34.89	35.31	35.74	36.17	36.60	37.02	37.45	37.88	38.31	38.73	39.16
78	Th	46.79	47.53	48.27	49.01	49.76	50.50	51.24	51.98	52.73	53.47	54.21	54.95	55.70	56.44	57.18	57.92	58.67	59.41	60.15	60.89	61.64	62.38	63.12
	Ca	29.50	29.92	30.35	30.78	31.20	31.63	32.06	32.49	32.91	33.34	33.77	34.20	34.62	35.05	35.48	35.91	36.33	36.76	37.19	37.62	38.04	38.47	38.90
76	Th	46.15	46.90	47.64	48.38	49.12	49.87	50.61	51.35	52.09	52.84	53.58	54.32	55.06	55.81	56.55	57.29	58.03	58.78	59.52	60.26	61.00	61.75	62.49
	Ca	29.23	29.66	30.09	30.51	30.94	31.37	31.80	32.22	32.65	33.08	33.51	33.93	34.36	34.79	35.22	35.64	36.07	36.50	36.93	37.35	37.78	38.21	38.64
74	Th	45.52	46.26	47.00	47.75	48.49	49.23	49.97	50.72	51.46	52.20	52.94	53.69	54.43	55.17	55.91	56.66	57.40	58.14	58.88	59.63	60.37	61.11	61.85
	Ca	28.97	29.40	29.82	30.25	30.68	31.11	31.53	31.96	32.39	32.82	33.24	33.67	34.10	34.53	34.95	35.38	35.81	36.24	36.66	37.09	37.52	37.94	38.37
72	Th	44.89	45.63	46.37	47.11	47.86	48.60	49.34	50.08	50.83	51.57	52.31	53.05	53.80	54.54	55.28	56.02	56.77	57.51	58.25	58.99	59.74	60.48	61.22
	Ca	28.71	29.13	29.56	29.99	30.42	30.84	31.27	31.70	32.13	32.55	32.98	33.41	33.84	34.26	34.69	35.12	35.54	35.97	36.40	36.83	37.25	37.68	38.11
70	Th	44.25	45.00	45.74	46.48	47.22	47.97	48.71	49.45	50.19	50.94	51.68	52.42	53.16	53.91	54.65	55.39	56.13	56.88	57.62	58.36	59.10	59.84	60.59
	Ca	28.44	28.87	29.30	29.73	30.15	30.58	31.01	31.43	31.86	32.29	32.72	33.14	33.57	34.00	34.43	34.85	35.28	35.71	36.14	36.56	36.99	37.42	37.85
68	Th	43.62	44.36	45.10	45.85	46.59	47.33	48.07	48.82	49.56	50.30	51.04	51.79	52.53	53.27	54.01	54.76	55.50	56.24	56.98	57.73	58.47	59.21	59.92
	Ca	28.18	28.61	29.03	29.46	29.89	30.32	30.74	31.17	31.60	32.03	32.45	32.88	33.31	33.74	34.16	34.59	35.02	35.45	35.87	36.30	36.73	37.16	37.58
66	Th	42.99	43.73	44.47	45.21	45.96	46.70	47.44	48.18	48.93	49.67	50.41	51.15	51.90	52.64	53.38	54.12	54.87	55.61	56.35	57.09	57.84	58.58	59.32
	Ca	27.92	28.34	28.77	29.20	29.63	30.05	30.48	30.91	31.34	31.76	32.19	32.62	33.05	33.47	33.90	34.33	34.76	35.18	35.61	36.04	36.47	36.89	37.32
64	Th	42.35	43.10	43.84	44.58	45.32	46.07	46.81	47.55	48.29	49.04	49.78	50.52	51.26	52.01	52.75	53.49	54.23	54.97	55.72	56.46	57.20	57.94	58.69
	Ca	27.65	28.08	28.51	28.94	29.36	29.79	30.22	30.65	31.07	31.50	31.93	32.36	32.78	33.21	33.64	34.07	34.49	34.92	35.35	35.78	36.20	36.63	37.06
62	Th	41.72	42.46	43.20	43.95	44.69	45.43	46.17	46.92	47.66	48.40	49.14	49.89	50.63	51.37	52.11	52.86	53.60	54.34	55.08	55.83	56.57	57.31	58.05
	Ca	27.39	27.82	28.25	28.67	29.10	29.53	29.96	30.38	30.81	31.24	31.67	32.09	32.52	32.95	33.37	33.80	34.23	34.66	35.08	35.51	35.94	36.37	36.79
60	Th	41.09	41.83	42.57	43.31	44.06	44.80	45.54	46.28	47.03	47.77	48.51	49.25	50.00	50.74	51.48	52.22	52.97	53.71	54.45	55.19	55.94	56.68	57.42
	Ca	27.13	27.56	27.98	28.41	28.84	29.27	29.69	30.12	30.55	30.97	31.40	31.83	32.26	32.68	33.11	33.54	33.97	34.39	34.82	35.25	35.68	36.10	36.53
58	Th	40.45	41.20	41.94	42.68	43.42	44.17	44.91	45.65	46.39	47.14	47.88	48.62	49.36	50.10	50.85	51.59	52.33	53.07	53.82	54.56	55.30	56.04	56.79
	Ca	26.87	27.29	27.72	28.15	28.57	29.00	29.43	29.86	30.28	30.71	31.14	31.57	31.99	32.42	32.85	33.28	33.70	34.13	34.56	34.99	35.41	35.84	36.27
56	Th	39.82	40.56	41.30	42.05	42.79	43.53	44.27	45.02	45.76	46.50	47.24	47.99	48.73	49.47	50.21	50.96	51.70	52.44	53.18	53.93	54.67	55.41	56.15
	Ca	26.60	27.03	27.46	27.88	28.31	28.74	29.17	29.59	30.02	30.45	30.88	31.30	31.73	32.16	32.59	33.01	33.44	33.87	34.30	34.72	35.15	35.58	36.01
54	Th	39.19	39.93	40.67	41.41	42.16	42.90	43.64	44.38	45.13	45.87	46.61	47.35	48.10	48.84	49.58	50.32	51.07	51.81	52.55	53.29	54.04	54.78	55.52
	Ca	26.34	26.77	27.19	27.62	28.05	28.48	28.90	29.33	29.76	30.19	30.61	31.04	31.47	31.90	32.32	32.75	33.18	33.61	34.03	34.46	34.89	35.31	35.74

Interpolation Table

Chest Circumference	Knee			
	Thigh		Calf	
	0	.1	0	.1
0	0	.371	0	.214
.1	.032	.403	.013	.227
.2	.063	.435	.026	.240
.3	.095	.466	.039	.253
.4	.127	.498	.053	.266
.5	.158	.530	.066	.279
.6	.190	.561	.079	.293
.7	.222	.593	.092	.306
.8	.253	.625	.105	.319
.9	.285	.656	.118	.332
1.0	.317	.688	.132	.345
1.1	.348	.720	.145	.358
1.2	.380	.751	.158	.372
1.3	.412	.783	.171	.385
1.4	.443	.815	.184	.398
1.5	.475	.846	.197	.411
1.6	.507	.878	.210	.424
1.7	.538	.910	.224	.437
1.8	.570	.941	.237	.450
1.9	.602	.973	.250	.464

Table 135

Norms for Upper Arm and Forearm of Sixteen-Year-Old Girls (Upper arm = .2112 chest circumference + 1.4861 elbow - .2030; forearm = .0895 chest circumference + 1.9128 elbow + 4.2923)

Chest Circumference, Centimeters		Elbow Width, Centimeters													
		4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4
90	UA	25.94	26.24	26.53	26.83	27.13	27.42	27.72	28.02	28.32	28.61	28.91	29.21	29.50	29.80
	FA	21.53	21.91	22.29	22.68	23.06	23.44	23.92	24.21	24.59	24.97	25.35	25.74	26.12	26.50
88	UA	25.52	25.81	26.11	26.41	26.70	27.00	27.30	27.60	27.89	28.19	28.49	28.79	29.08	29.38
	FA	21.35	21.73	22.11	22.50	22.88	23.26	23.65	24.03	24.41	24.79	25.18	25.56	25.94	26.32
86	UA	25.09	25.39	25.69	25.99	26.28	26.58	26.98	27.17	27.47	27.77	28.07	28.36	28.66	28.96
	FA	21.17	21.55	21.94	22.32	22.70	23.08	23.47	23.85	24.23	24.51	25.00	25.38	25.76	26.14
84	UA	24.67	24.97	25.27	25.56	25.86	26.16	26.45	26.75	27.05	27.35	27.64	27.94	28.24	28.53
	FA	20.99	21.37	21.76	22.14	22.52	22.90	23.29	23.67	24.05	24.43	24.82	25.20	25.58	25.97
82	UA	24.25	24.55	24.84	25.14	25.44	25.73	26.03	26.33	26.63	26.92	27.22	27.52	27.82	28.11
	FA	20.81	21.20	21.58	21.96	22.34	22.73	23.11	23.49	23.87	24.26	24.64	25.02	25.40	25.79
80	UA	23.83	24.12	24.42	24.72	25.02	25.31	25.61	25.91	26.20	26.50	26.80	27.10	27.39	27.69
	FA	20.63	21.02	21.40	21.78	22.16	22.55	22.93	23.31	23.69	24.08	24.46	24.94	25.22	25.61
78	UA	23.40	23.70	24.00	24.30	24.59	24.89	25.19	25.48	25.78	26.08	26.38	26.67	26.97	27.27
	FA	20.45	20.84	21.22	21.60	21.98	22.37	22.75	23.13	23.52	23.90	24.28	24.66	25.05	25.43
76	UA	22.98	23.28	23.58	23.87	24.17	24.47	24.76	25.06	25.36	25.66	25.95	26.25	26.55	26.85
	FA	20.28	20.66	21.04	21.42	21.81	22.19	22.57	22.95	23.34	23.72	24.10	24.48	24.87	25.25
74	UA	22.56	22.96	23.15	23.45	23.75	24.05	24.34	24.54	24.94	25.23	25.53	25.83	26.13	26.42
	FA	20.10	20.48	20.86	21.24	21.63	22.01	22.39	22.77	23.16	23.54	23.92	24.30	24.69	25.07
72	UA	22.14	22.43	22.73	23.03	23.33	23.62	23.92	24.22	24.51	24.81	25.11	25.41	25.70	26.00
	FA	19.92	20.30	20.68	21.07	21.45	21.83	22.21	22.60	22.98	23.36	23.74	24.13	24.51	24.89
70	UA	21.71	22.01	22.31	22.61	22.90	23.20	23.50	23.79	24.09	24.39	24.69	24.98	25.28	25.58
	FA	19.74	20.12	20.50	20.89	21.27	21.65	22.03	22.42	22.80	23.18	23.56	23.95	24.33	24.71
68	UA	21.29	21.59	21.89	22.18	22.48	22.78	23.08	23.37	23.67	23.97	24.26	24.56	24.86	25.16
	FA	19.56	19.94	20.32	20.71	21.09	21.47	21.36	22.24	22.62	23.00	23.39	23.77	24.15	24.53
66	UA	20.87	21.17	21.46	21.76	22.06	22.36	22.65	22.95	23.25	23.54	23.84	24.14	24.44	24.73
	FA	19.38	19.76	20.15	20.53	20.91	21.29	21.68	22.06	22.44	22.82	23.21	23.59	23.97	24.35
64	UA	20.45	20.74	21.04	21.34	21.64	21.93	22.23	22.53	22.82	23.12	23.42	23.72	24.01	24.31
	FA	19.20	19.58	19.97	20.35	20.73	21.11	21.50	21.88	22.26	22.64	23.03	23.41	23.79	24.18
62	UA	20.02	20.32	20.62	20.92	21.21	21.51	21.81	22.11	22.40	22.70	23.00	23.29	23.59	23.89
	FA	19.02	19.41	19.79	20.17	20.55	20.94	21.32	21.70	22.08	22.47	22.85	23.23	23.61	24.00
60	UA	19.60	19.90	20.20	20.49	20.79	21.09	21.39	21.68	21.98	22.28	22.57	22.87	23.17	23.47
	FA	18.84	19.23	19.61	19.99	20.37	20.76	21.14	21.52	21.90	22.29	22.67	23.05	23.43	23.82
58	UA	19.18	19.48	19.77	20.07	20.37	20.67	20.96	21.26	21.56	21.85	22.15	22.45	22.75	23.04
	FA	18.66	19.05	19.43	19.81	20.19	20.58	20.96	21.34	21.73	22.11	22.49	22.87	23.26	23.64
56	UA	18.76	19.05	19.35	19.65	19.95	20.24	20.54	20.84	21.14	21.43	21.73	22.03	22.32	22.62
	FA	18.49	18.87	19.25	19.63	20.02	20.40	20.78	21.16	21.55	21.93	22.31	22.69	23.08	23.46
54	UA	18.34	18.63	18.93	19.23	19.52	19.82	20.12	20.42	20.71	21.01	21.31	21.60	21.90	22.20
	FA	18.31	18.69	19.07	19.45	19.84	20.22	20.60	20.98	21.37	21.75	22.13	22.51	22.90	23.28

Interpolation Table

Chest Circumference	Elbow			
	Upper Arm		Forearm	
	0	.1	0	.1
0	0	.149	0	.191
.1	.021	.170	.009	.200
.2	.042	.191	.018	.209
.3	.063	.212	.027	.218
.4	.084	.233	.036	.227
.5	.106	.254	.045	.236
.6	.127	.275	.054	.245
.7	.148	.296	.063	.254
.8	.169	.318	.072	.263
..9	.190	.339	.081	.272
1.0	.211	.360	.090	.281
1.1	.232	.381	.098	.290
1.2	.253	.402	.107	.299
1.3	.275	.423	.116	.308
1.4	.296	.444	.125	.317
1.5	.317	.465	.134	.326
1.6	.338	.487	.143	.334
1.7	.359	.508	.152	.343
1.8	.380	.529	.161	.352
1.9	.401	.550	.170	.361

Table 130

Norms for Thigh and Calf of Sixteen-Year-Old Girls (Thigh = .4012 chest circumference + 3.6608 knee - 10.2730; calf = .1520 chest circumference + 1.8660 knee + 4.8965)

Chest Circumference, Centimeters		Knee Width, Centimeters																	
		6.9	7.2	7.5	7.8	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.7	12.0
90	Th	51.09	52.19	53.29	54.39	55.49	56.59	57.69	58.79	59.89	60.99	62.08	63.19	64.27	65.37	66.47	67.57	68.67	69.76
	Ca	31.45	32.01	32.57	33.13	33.69	34.25	34.81	35.37	35.93	36.49	37.05	37.61	38.17	38.73	39.29	39.85	40.41	40.97
88	Th	50.29	51.39	52.49	53.59	54.69	55.79	56.88	57.98	59.08	60.18	61.27	62.37	63.47	64.57	65.67	66.77	67.86	68.96
	Ca	31.15	31.71	32.27	32.83	33.39	33.95	34.51	35.07	35.63	36.19	36.75	37.31	37.87	38.43	38.99	39.54	40.10	40.66
86	Th	49.49	50.59	51.68	52.78	53.88	54.98	56.08	57.18	58.28	59.37	60.47	61.57	62.67	63.77	64.87	65.96	67.06	68.16
	Ca	30.84	31.40	31.96	32.52	33.08	33.64	34.20	34.76	35.32	35.88	36.44	37.00	37.56	38.12	38.68	39.24	39.80	40.36
84	Th	48.69	49.79	50.88	51.98	53.08	54.18	55.28	56.38	57.47	58.57	59.67	60.77	61.37	62.96	64.06	65.16	66.26	67.36
	Ca	30.54	31.10	31.66	32.22	32.78	33.34	33.90	34.46	35.02	35.58	36.14	36.70	37.26	37.82	38.38	38.94	39.50	40.06
82	Th	47.88	48.98	50.08	51.18	52.28	53.38	54.47	55.57	56.67	57.77	58.87	59.97	61.06	62.16	63.26	64.36	65.46	66.50
	Ca	30.24	30.80	31.36	31.92	32.48	33.03	33.59	34.15	34.71	35.27	35.83	36.39	36.95	37.51	38.07	38.63	39.19	39.75
80	Th	47.08	48.18	49.28	50.38	51.48	52.57	53.67	54.77	55.87	56.97	58.06	59.16	60.26	61.36	62.46	63.56	64.65	65.75
	Ca	29.93	30.49	31.05	31.61	32.17	32.73	33.29	33.85	34.41	34.97	35.53	36.09	36.65	37.21	37.77	38.33	38.89	39.45
78	Th	46.28	47.38	48.48	49.57	50.57	51.77	52.87	53.97	55.07	56.16	57.26	58.36	59.46	60.56	61.66	62.75	63.85	64.95
	Ca	29.63	30.19	30.75	31.31	31.87	32.43	32.99	33.55	34.11	34.67	35.23	35.79	36.35	36.91	37.47	38.02	38.58	39.14
76	Th	45.48	46.58	47.67	48.77	49.87	50.97	52.07	53.17	54.26	55.36	56.45	57.56	58.66	59.75	60.85	61.95	63.05	64.15
	Ca	29.32	29.88	30.44	31.00	31.56	32.12	32.68	33.24	33.80	34.36	34.92	35.48	36.04	36.60	37.16	37.72	38.28	38.84
74	Th	44.68	45.77	46.87	47.97	49.07	50.17	51.26	52.36	53.46	54.56	55.66	56.76	57.35	58.95	60.05	61.15	62.25	63.35
	Ca	29.02	29.58	30.14	30.70	31.26	31.82	32.38	32.94	33.50	34.06	34.62	35.18	35.74	36.30	36.86	37.42	37.98	38.54
72	Th	43.87	44.97	46.07	47.17	48.27	49.36	50.46	51.56	52.65	53.76	54.86	55.95	57.05	58.15	59.25	60.35	61.44	62.54
	Ca	28.72	29.28	29.84	30.40	30.96	31.51	32.07	32.63	33.19	33.75	34.31	34.87	35.43	35.99	36.55	37.12	37.67	38.23
70	Th	43.07	44.17	45.27	46.37	47.46	48.56	49.66	50.76	51.86	52.95	54.05	55.15	56.25	57.35	58.45	59.54	60.64	61.74
	Ca	28.41	28.97	29.53	30.09	30.65	31.21	31.77	32.33	32.89	33.45	34.01	34.57	35.13	35.69	36.25	36.81	37.37	37.93
68	Th	42.27	43.37	44.46	45.56	46.66	47.76	48.86	49.96	51.05	52.16	53.25	54.35	55.45	56.55	57.64	58.74	59.84	60.94
	Ca	28.11	28.67	29.23	29.79	30.35	30.91	31.47	32.03	32.59	33.15	33.71	34.27	34.83	35.39	35.95	36.50	37.06	37.62
66	Th	41.47	42.56	43.66	44.76	45.86	46.96	48.06	49.16	50.25	51.35	52.45	53.55	54.64	55.74	56.84	57.94	59.04	60.14
	Ca	27.80	28.36	28.92	29.48	30.04	30.60	31.16	31.72	32.28	32.84	33.40	33.96	34.52	35.08	35.64	36.20	36.76	37.32
64	Th	40.66	41.76	42.86	43.96	45.06	46.15	47.25	48.35	49.45	50.55	51.65	52.74	53.84	54.94	56.04	57.14	58.24	59.33
	Ca	27.50	28.06	28.62	29.18	29.74	30.30	30.86	31.42	31.98	32.54	33.10	33.66	34.22	34.78	35.34	35.90	36.46	37.02
62	Th	39.85	40.96	42.06	43.16	44.25	45.35	46.45	47.55	48.65	49.75	50.84	51.94	53.04	54.14	55.24	56.33	57.43	58.53
	Ca	27.20	27.76	28.32	28.88	29.44	29.99	30.55	31.11	31.67	32.23	32.79	33.35	33.91	34.47	35.03	35.59	36.15	36.71
60	Th	39.06	40.16	41.26	42.35	43.45	44.55	45.65	46.75	47.84	48.94	50.04	51.14	52.24	53.34	54.43	55.53	56.63	57.73
	Ca	26.89	27.45	28.01	28.57	29.13	29.69	30.25	30.81	31.37	31.93	32.49	33.05	33.61	34.17	34.73	35.29	35.85	36.41
58	Th	38.26	39.35	40.45	41.55	42.65	43.75	44.85	45.94	47.04	48.14	49.24	50.34	51.44	52.53	53.63	54.73	55.83	56.93
	Ca	26.59	27.15	27.71	28.27	28.83	29.39	29.95	30.51	31.07	31.63	32.19	32.75	33.31	33.87	34.43	34.98	35.54	36.10
56	Th	37.45	38.55	39.65	40.75	41.85	42.94	44.04	45.14	46.24	47.34	48.44	49.53	50.63	51.73	52.83	53.93	55.03	56.12
	Ca	26.28	26.84	27.40	27.96	28.52	29.08	29.64	30.20	30.76	31.32	31.88	32.44	33.00	33.56	34.12	34.68	35.24	35.80
54	Th	36.65	37.75	38.85	39.95	41.04	42.14	43.24	44.34	45.44	46.54	47.63	48.73	49.83	50.93	52.03	53.12	54.22	55.32
	Ca	25.99	26.54	27.10	27.66	28.22	28.78	29.34	29.90	30.46	31.02	31.58	32.14	32.70	33.26	33.82	34.38	34.94	35.50

Interpolation Table

Chest Circumference	Knee					
	Thigh			Calf		
	0	.1	.2	0	.1	.2
0	0	.366	.732	0	.187	.373
.1	.040	.406	.772	.015	.202	.388
.2	.080	.446	.812	.030	.217	.404
.3	.120	.486	.853	.046	.232	.419
.4	.160	.527	.893	.061	.247	.434
.5	.200	.567	.933	.076	.263	.449
.6	.241	.607	.973	.091	.278	.464
.7	.281	.647	1.013	.106	.293	.480
.8	.321	.687	1.053	.122	.308	.495
.9	.361	.727	1.093	.137	.323	.510
1.0	.401	.767	1.133	.152	.339	.525
1.1	.441	.807	1.173	.167	.354	.540
1.2	.481	.848	1.214	.182	.369	.556
1.3	.522	.888	1.254	.198	.384	.571
1.4	.562	.928	1.294	.213	.399	.586
1.5	.602	.968	1.334	.228	.415	.601
1.6	.642	1.008	1.374	.243	.430	.616
1.7	.682	1.048	1.414	.258	.445	.632
1.8	.722	1.088	1.454	.274	.460	.647
1.9	.762	1.128	1.494	.289	.475	.662

Table 137

Norms for Upper Arm and Forearm of Seventeen-Year-Old Girls (Upper arm = .1794 chest circumference + .7021 elbow + 7.1497; forearm = .0676 chest circumference + 1.6334 elbow + 7.8972)

Chest Circumference, Centimeters		Elbow Width, Centimeters																							
		5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2
88	UA	26.45	26.52	26.59	26.66	26.73	26.80	26.87	26.94	27.01	27.08	27.15	27.22	27.29	27.36	27.43	27.50	27.57	27.64	27.71	27.78	27.85	27.92	27.99
	FA	22.01	22.18	22.34	22.50	22.67	22.83	22.99	23.16	23.32	23.48	23.65	23.31	23.97	24.14	24.30	24.46	24.63	24.79	24.95	25.12	25.28	25.44	25.61
86	UA	26.09	26.16	26.23	26.30	26.37	26.44	26.51	26.58	26.65	26.72	26.79	26.86	26.93	27.00	27.07	27.14	27.21	27.28	27.35	27.42	27.49	27.56	27.63
	FA	21.88	22.04	22.20	22.37	22.53	22.69	22.86	23.02	23.18	23.35	23.51	23.67	23.84	24.00	24.16	24.33	24.49	24.65	24.82	24.98	25.14	25.31	25.47
84	UA	25.73	25.80	25.87	25.94	26.01	26.08	26.15	26.22	26.29	26.36	26.43	26.50	26.57	26.64	26.71	26.78	26.85	26.92	26.99	27.06	27.13	27.20	27.27
	FA	21.74	22.91	22.07	22.23	22.40	22.56	22.72	22.89	23.05	23.21	23.38	23.54	23.70	23.87	24.03	24.19	24.36	24.52	24.68	24.85	25.01	25.17	25.34
82	UA	25.37	25.44	25.51	25.58	25.65	25.72	25.79	25.86	25.93	26.00	26.07	26.14	26.21	26.28	26.35	26.42	26.49	26.56	26.63	26.70	26.78	26.85	26.92
	FA	21.61	21.77	21.93	22.10	22.26	22.42	22.59	22.75	22.91	23.08	23.24	23.40	23.57	23.73	23.89	24.06	24.22	22.38	24.55	24.71	24.87	25.04	25.20
80	UA	25.01	25.07	25.15	25.22	25.29	25.36	25.43	25.50	25.57	25.64	25.71	25.78	25.85	25.92	26.00	26.07	26.14	26.21	26.28	26.35	26.42	26.49	26.56
	FA	21.47	21.64	21.80	21.96	22.13	22.79	22.45	22.62	22.78	22.94	23.11	23.27	23.43	23.60	23.76	23.92	24.09	24.25	24.41	24.58	24.74	24.90	25.07
78	UA	24.65	24.72	24.79	24.86	24.93	25.00	25.07	25.14	25.22	25.29	25.36	25.43	25.50	25.57	25.64	25.71	25.78	25.85	25.92	25.99	26.06	26.13	26.20
	FA	21.34	21.50	21.66	21.83	21.99	22.15	22.32	22.48	22.64	22.81	22.97	23.13	23.30	23.46	23.62	23.79	23.95	24.11	24.28	24.44	24.60	24.77	24.93
76	UA	24.29	24.36	24.44	24.51	24.58	24.65	24.72	24.79	24.86	24.93	25.00	25.07	25.14	25.21	25.28	25.35	25.42	25.49	25.56	25.63	25.70	25.77	25.84
	FA	21.20	21.37	21.53	21.69	21.86	22.02	22.18	22.35	22.51	22.67	22.84	23.00	23.16	23.33	23.49	23.65	23.82	23.98	24.14	24.31	24.47	24.63	24.80
74	UA	23.94	23.01	24.08	24.15	24.22	24.29	24.36	24.43	24.50	24.57	24.64	24.71	24.78	24.85	24.92	24.99	25.06	25.13	25.20	25.27	25.34	25.41	25.48
	FA	21.07	21.23	21.39	21.56	21.72	21.88	22.05	22.21	22.37	22.54	22.70	22.86	23.03	23.19	23.35	23.52	23.68	23.84	24.01	24.17	24.33	24.50	24.66
72	UA	23.58	23.65	23.72	23.79	23.86	23.93	24.00	24.07	24.14	24.21	24.28	24.35	24.42	24.49	24.56	24.63	24.70	24.77	24.84	24.91	24.98	25.05	25.12
	FA	20.93	21.09	21.26	21.42	21.58	21.75	21.91	22.07	22.24	22.40	22.56	22.73	22.89	23.05	23.22	23.38	23.54	23.71	23.87	24.03	24.20	24.36	24.52
70	UA	23.22	23.29	23.36	23.43	23.50	23.57	23.64	23.71	23.78	23.85	23.92	23.99	24.06	24.13	24.20	24.27	24.34	24.41	24.48	24.55	24.62	24.69	24.76
	FA	20.80	20.96	21.12	21.29	21.45	21.61	21.78	21.94	22.10	22.27	22.43	22.59	22.76	22.92	23.08	23.25	23.41	23.57	23.74	23.90	24.06	24.23	24.39
68	UA	22.86	22.93	23.00	23.07	23.14	23.21	23.28	23.35	23.42	23.49	23.56	23.63	23.70	23.77	23.84	23.91	23.98	24.05	24.12	24.19	24.26	24.33	24.40
	FA	20.66	20.82	20.99	21.15	21.31	21.48	21.64	21.80	21.97	22.13	22.29	22.46	22.62	22.78	22.95	23.11	23.27	23.44	23.60	23.76	23.93	24.09	24.25
66	UA	22.50	22.57	22.64	22.71	22.78	22.85	22.92	22.99	23.06	23.13	23.20	23.27	23.34	23.41	23.48	23.55	23.62	23.69	23.76	23.83	23.90	23.98	24.05
	FA	20.53	20.69	20.85	21.02	21.18	21.34	21.51	21.67	21.83	22.00	22.16	22.32	22.49	22.65	22.81	22.98	23.14	23.30	23.47	23.63	23.79	23.96	24.12
64	UA	22.14	22.21	22.28	22.35	22.42	22.49	22.56	22.63	22.70	22.77	22.84	22.91	22.98	23.05	23.12	23.19	23.27	23.34	23.41	23.48	23.55	23.62	23.69
	FA	20.39	20.55	20.72	20.88	21.04	21.21	21.37	21.53	21.70	21.86	22.02	22.19	22.35	22.51	22.68	22.84	23.00	23.17	23.33	23.49	23.66	23.82	23.98
62	UA	21.78	21.85	21.92	21.99	22.06	22.13	22.20	22.27	22.34	22.41	22.49	22.56	22.63	22.70	22.77	22.84	22.91	22.98	23.05	23.12	23.19	23.26	23.33
	FA	20.26	20.42	20.58	20.75	20.91	21.07	21.24	21.40	21.56	21.73	21.89	22.05	22.22	22.38	22.54	22.71	22.87	23.03	23.20	23.36	23.52	23.69	23.85
60	UA	21.42	21.49	21.56	21.63	21.71	21.78	21.85	21.92	21.99	22.06	22.13	22.20	22.27	22.34	22.41	22.48	22.55	22.62	22.69	22.76	22.83	22.90	22.97
	FA	20.12	20.28	20.45	20.61	20.77	20.94	21.10	21.26	21.43	21.59	21.75	21.92	22.08	22.24	22.41	22.57	22.73	22.90	23.06	23.22	23.39	23.55	23.71
58	UA	21.07	21.14	21.21	21.28	21.35	21.42	21.49	21.56	21.63	21.70	21.77	21.84	21.91	21.98	22.05	22.12	22.19	22.26	22.33	22.40	22.47	22.54	22.61
	FA	19.99	20.15	20.31	20.48	20.64	20.80	20.97	21.13	21.29	21.46	21.62	21.78	21.95	22.11	22.27	22.44	22.60	22.76	22.93	23.09	23.25	23.42	23.58
56	UA	20.71	20.78	20.85	20.92	20.99	21.06	21.13	21.20	21.27	21.34	21.41	21.48	21.55	21.62	21.69	21.76	21.83	21.90	21.97	22.04	22.11	22.18	22.25
	FA	19.85	20.01	20.18	20.34	20.50	20.67	20.83	20.99	21.16	21.32	21.48	21.65	21.81	21.97	22.14	22.30	22.46	22.63	22.79	22.95	23.12	23.28	23.44

Interpolation Table

Chest Circumference	Elbow Upper Arm	Elbow Forearm
	0	0
0	0	0
.1	.018	.007
.2	.036	.014
.3	.054	.020
.4	.072	.027
.5	.090	.034
.6	.108	.041
.7	.126	.047
.8	.144	.054
.9	.161	.061
1.0	.179	.068
1.1	.197	.074
1.2	.215	.081
1.3	.233	.088
1.4	.251	.095
1.5	.269	.101
1.6	.287	.108
1.7	.305	.105
1.8	.323	.122
1.9	.341	.128

Table 138

Norms for Thigh and Calf of Seventeen-Year-Old Girls (Thigh = .3535 chest circumference
+ 3.0251 knee + .1742; calf = .1337 chest circumference
+ 1.4852 knee + 9.6894)

Chest Circumference, Centimeters		Knee Width, Centimeters																
		7.2	7.5	7.8	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.7	12.0
88	Th	53.09	54.00	54.90	55.81	56.72	57.63	58.53	59.44	60.35	61.26	62.16	63.07	63.98	64.89	65.79	66.70	67.61
	Ca	32.15	32.59	33.04	33.49	33.93	34.38	34.82	35.27	35.71	36.16	36.60	37.05	37.50	37.94	38.39	38.83	39.28
86	Th	52.38	53.29	54.20	55.10	56.01	56.92	57.83	58.73	59.64	60.55	61.46	62.36	63.27	64.18	65.09	65.99	66.90
	Ca	31.88	32.33	32.77	33.22	33.66	34.11	34.55	35.00	35.45	35.89	36.34	36.78	37.23	37.67	38.12	38.56	39.01
84	Th	51.67	52.58	53.49	54.40	55.30	56.21	57.12	58.03	58.93	59.84	60.75	61.66	62.56	63.47	64.38	65.29	66.19
	Ca	31.61	32.06	32.50	32.95	33.40	33.84	34.29	34.73	35.18	35.62	36.07	36.51	36.96	37.41	37.85	38.30	38.74
82	Th	50.97	51.87	52.78	53.69	54.60	55.50	56.41	57.32	58.23	59.13	60.04	60.95	61.86	62.76	63.67	64.58	65.49
	Ca	31.35	31.79	32.24	32.68	33.13	33.57	34.02	34.47	34.91	35.36	35.80	36.25	36.69	37.14	37.58	38.03	38.48
80	Th	50.26	51.17	52.07	52.98	53.89	54.80	55.70	56.61	57.52	58.43	59.33	60.24	61.15	62.06	62.96	63.87	64.78
	Ca	31.08	31.52	31.97	32.42	32.86	33.31	33.75	34.20	34.64	35.09	35.52	35.98	36.43	36.87	37.32	37.76	38.21
78	Th	49.55	50.46	51.37	52.27	53.18	54.09	55.00	55.90	56.81	57.72	58.63	59.53	60.44	61.35	62.26	63.16	64.07
	Ca	30.81	31.26	31.70	32.15	32.59	33.04	33.48	33.93	34.38	34.82	35.27	35.71	36.16	36.60	37.05	37.49	37.94
76	Th	48.84	49.75	50.66	51.57	52.47	53.38	54.29	55.20	56.10	57.01	57.92	58.83	59.73	60.64	61.55	62.46	63.36
	Ca	30.54	30.99	31.44	31.88	32.33	32.77	33.22	33.66	34.11	34.55	35.00	35.45	35.89	36.34	36.78	37.23	37.67
74	Th	48.14	49.04	49.95	50.86	51.77	52.67	53.58	54.49	55.40	56.30	57.21	58.12	59.03	59.93	60.84	61.75	62.66
	Ca	30.28	30.72	31.17	31.61	32.06	32.50	32.95	33.40	33.84	34.29	34.73	35.18	35.62	36.07	36.51	36.96	37.41
72	Th	47.43	48.34	49.24	50.15	51.06	51.97	52.87	53.78	54.69	55.60	56.50	57.41	58.32	59.23	60.13	61.04	61.95
	Ca	30.01	30.45	30.90	31.35	31.79	32.24	32.68	33.13	33.57	34.02	34.46	34.91	35.36	35.80	36.25	36.69	37.14
70	Th	46.72	47.63	48.54	49.44	50.35	51.26	52.17	53.07	53.98	54.89	55.80	56.70	57.61	58.52	59.43	60.33	61.24
	Ca	29.74	30.19	30.63	31.08	31.52	31.97	32.42	32.86	33.31	33.75	34.20	34.64	35.09	35.53	35.98	36.43	36.87
68	Th	46.01	46.92	47.83	48.74	49.64	50.55	51.46	52.37	53.27	54.18	55.09	56.00	56.90	57.81	58.72	59.63	60.53
	Ca	29.47	29.92	30.37	30.81	31.26	31.70	32.15	32.59	33.04	33.48	33.93	34.38	34.82	35.27	35.71	36.16	36.60
66	Th	45.31	46.21	47.12	48.03	48.94	49.84	50.75	51.66	52.57	53.47	54.38	55.29	56.20	57.10	58.01	58.92	59.83
	Ca	29.21	29.65	30.10	30.54	30.99	31.43	31.88	32.33	32.77	33.22	33.66	34.11	34.55	35.00	35.44	35.89	36.34
64	Th	44.60	45.51	46.41	47.32	48.23	49.14	50.04	50.95	51.86	52.77	53.67	54.58	55.49	56.40	57.30	58.21	59.12
	Ca	28.94	29.39	29.83	30.28	30.72	31.17	31.61	32.06	32.50	32.95	33.40	33.84	34.29	34.73	35.18	35.62	36.07
62	Th	43.89	44.80	45.71	46.61	47.52	48.43	49.34	50.24	51.15	52.06	52.97	53.87	54.78	55.69	56.60	57.50	58.51
	Ca	28.67	29.12	29.56	30.01	30.45	30.90	31.35	31.79	32.24	32.68	33.13	33.57	34.02	34.46	34.91	35.36	35.80
60	Th	43.18	44.09	45.00	45.91	46.81	47.72	48.63	49.54	50.44	51.35	52.26	53.17	54.07	54.98	55.89	56.80	57.70
	Ca	28.40	28.85	29.30	29.74	30.19	30.63	31.08	31.52	31.97	32.41	32.86	33.21	33.75	34.20	34.64	35.09	35.53
58	Th	42.48	43.38	44.29	45.20	46.11	47.01	47.92	48.83	49.74	50.64	51.55	52.46	53.37	54.27	55.18	56.09	57.00
	Ca	28.14	28.58	29.03	29.47	29.92	30.37	30.81	31.26	31.70	32.15	32.59	33.04	33.48	33.93	34.38	34.82	35.27
56	Th	41.77	42.68	43.58	44.49	45.40	46.31	47.21	48.12	49.03	49.94	50.84	51.75	52.66	53.57	54.47	55.38	56.29
	Ca	27.87	28.32	28.76	29.21	29.65	30.10	30.54	30.99	31.43	31.88	32.33	32.77	33.22	33.66	34.11	34.55	35.00

Interpolation Table

Chest Circumference	Knee					
	Thigh			Calf		
	0	.1	.2	0	.1	.2
0	0	.303	.605	0	.149	.297
.1	.035	.338	.640	.013	.162	.310
.2	.071	.373	.676	.027	.175	.324
.3	.106	.409	.711	.040	.189	.337
.4	.142	.444	.747	.053	.202	.351
.5	.177	.479	.782	.067	.215	.364
.6	.212	.515	.817	.080	.229	.377
.7	.248	.550	.853	.094	.242	.391
.8	.283	.586	.888	.107	.255	.404
.9	.318	.621	.923	.120	.269	.417
1.0	.354	.656	.959	.134	.282	.431
1.1	.389	.692	.994	.147	.296	.444
1.2	.425	.727	1.030	.160	.309	.457
1.3	.460	.762	1.065	.174	.322	.471
1.4	.495	.798	1.100	.187	.336	.484
1.5	.531	.833	1.136	.201	.349	.498
1.6	.566	.869	1.171	.214	.362	.511
1.7	.601	.904	1.206	.227	.376	.524
1.8	.637	.939	1.242	.241	.389	.538
1.9	.672	.975	1.277	.254	.403	.551

Table 139

Norms for Upper Arm, Forearm, Thigh, and Calf of College Women (Upper arm = .2229 chest circumference + 1.2375 knee - 4.5009; forearm = .1268 chest circumference + .6790 knee + 4.8555; thigh = .3904 chest circumference + 2.9363 knee - 2.1415; calf = .1506 chest circumference + 1.6849 knee + 4.7606)

Chest Circumference, Centimeters	Measurement	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2
90	Upper arm	24.72	24.97	25.21	25.46	25.71	25.96	26.20	26.45	26.70	26.95	27.19	27.44	27.69	27.94	28.19	28.43	28.68	28.93	29.17	29.42
	Forearm	22.93	23.11	23.29	23.46	23.64	23.81	23.99	24.16	24.34	24.52	24.69	24.87	25.04	25.22	25.40	25.57	25.75	25.92	26.10	26.27
	Thigh	54.72	55.31	55.90	56.48	57.07	57.66	58.25	58.83	59.42	60.01	60.60	61.18	61.77	62.36	62.94	63.53	64.12	64.71	65.29	65.88
	Calf	32.26	32.64	33.02	33.39	33.77	34.15	34.52	34.90	35.28	35.66	36.03	36.41	36.79	37.16	37.54	37.92	38.29	38.67	39.05	39.43
89	Upper arm	24.49	24.74	24.99	25.24	25.48	25.73	25.98	26.23	26.47	26.72	26.97	27.22	27.46	27.71	27.96	28.21	28.45	28.70	28.95	29.20
	Forearm	22.81	22.98	23.16	23.33	23.51	23.68	23.86	24.04	24.21	24.39	24.56	24.74	24.92	25.09	25.27	25.44	25.62	25.79	25.97	26.15
	Thigh	54.33	54.92	55.51	56.09	56.68	57.27	57.86	58.44	59.03	59.62	60.21	60.79	61.38	61.97	62.55	63.14	63.73	64.32	64.90	65.49
	Calf	32.11	32.49	32.87	33.24	33.62	34.00	34.37	34.75	35.13	35.51	35.88	36.26	36.64	37.01	37.39	37.77	38.14	38.52	38.90	39.27
88	Upper arm	24.27	24.52	24.77	25.01	25.26	25.51	25.76	26.00	26.25	26.50	26.75	26.99	27.24	27.49	27.74	27.98	28.23	28.48	28.73	28.97
	Forearm	22.68	22.85	23.03	23.20	23.38	23.56	23.73	23.91	24.08	24.26	24.43	24.61	24.79	24.96	25.14	25.31	25.49	25.67	25.84	26.02
	Thigh	53.94	54.53	55.12	55.70	56.29	56.88	57.47	58.05	58.64	59.23	59.81	60.40	60.99	61.58	62.16	62.75	63.34	63.93	64.51	65.10
	Calf	31.96	32.34	32.72	33.09	33.47	33.85	34.22	34.60	34.98	35.35	35.73	36.11	36.49	36.86	37.24	37.62	37.99	38.37	38.75	39.12
87	Upper arm	24.05	24.30	24.54	24.79	25.04	25.29	25.53	25.78	26.03	26.28	26.52	26.77	27.02	27.27	27.51	27.76	28.01	28.26	28.50	28.75
	Forearm	22.55	22.72	22.90	23.08	23.25	23.43	23.60	23.78	23.95	24.13	24.31	24.48	24.66	24.83	25.01	25.19	25.36	25.54	25.71	25.89
	Thigh	53.55	54.14	54.73	55.31	55.90	56.49	57.08	57.66	58.25	58.84	59.42	60.01	60.60	61.19	61.77	62.36	62.95	63.54	64.12	64.71
	Calf	31.81	32.19	32.57	32.94	33.32	33.70	34.07	34.45	34.83	35.20	35.58	35.96	36.33	36.71	37.09	37.47	37.84	38.22	38.60	38.97
86	Upper arm	23.83	24.07	24.32	24.57	24.82	25.06	25.31	25.56	25.81	26.05	26.30	26.55	26.80	27.04	27.29	27.54	27.79	28.03	28.28	28.53
	Forearm	22.42	22.60	22.77	22.95	23.12	23.30	23.47	23.65	23.83	24.00	24.18	24.35	24.53	24.71	24.88	25.06	25.23	25.41	25.58	25.76
	Thigh	53.16	53.75	54.34	54.92	55.51	56.10	56.69	57.27	57.86	58.45	59.03	59.62	60.21	60.80	61.38	61.97	62.56	63.14	63.73	64.32
	Calf	31.66	32.04	32.41	32.79	33.17	33.55	33.92	34.30	34.68	35.05	35.43	35.81	36.18	36.56	36.94	37.32	37.69	38.07	38.45	38.82
85	Upper arm	23.60	23.85	24.10	24.35	24.59	24.84	25.09	25.34	25.58	25.83	26.08	26.33	26.57	26.82	27.07	27.32	27.56	27.81	28.06	28.31
	Forearm	22.29	22.47	22.64	22.82	22.99	23.17	23.35	23.52	23.70	23.87	24.05	24.22	24.40	24.58	24.75	24.93	25.10	25.28	25.46	25.63
	Thigh	52.77	53.36	53.95	54.53	55.12	55.71	56.29	56.88	57.47	58.06	58.64	59.23	59.82	60.41	60.99	61.58	62.17	62.75	63.34	63.93
	Calf	31.51	31.89	32.26	32.64	33.02	33.39	33.77	34.15	34.53	34.90	35.28	35.66	36.03	36.41	36.79	37.16	37.54	37.92	38.30	38.67
84	Upper arm	23.38	23.63	23.88	24.12	24.37	24.62	24.87	25.11	25.36	25.61	25.86	26.10	26.35	26.60	26.85	27.09	27.34	27.59	27.84	28.08
	Forearm	22.16	22.34	22.51	22.69	22.87	23.04	23.22	23.39	23.57	23.74	23.92	24.10	24.27	24.45	24.62	24.80	24.98	25.15	25.33	25.50
	Thigh	52.38	52.97	53.56	54.14	54.73	55.32	55.90	56.49	57.08	57.67	58.25	58.84	59.43	60.02	60.60	61.19	61.78	62.36	62.95	63.54
	Calf	31.36	31.74	32.11	32.49	32.87	33.24	33.62	34.00	34.38	34.75	35.13	35.51	35.88	36.26	36.64	37.01	37.39	37.77	38.14	38.52
83	Upper arm	23.16	23.40	23.65	23.90	24.15	24.39	24.64	24.89	25.14	25.38	25.63	25.88	26.13	26.37	26.62	26.87	27.12	27.36	27.61	27.86
	Forearm	22.03	22.21	22.39	22.56	22.74	22.91	23.09	23.26	23.44	23.62	23.79	23.97	24.14	24.32	24.50	24.67	24.85	25.02	25.20	25.37
	Thigh	51.99	52.58	53.17	53.75	54.34	54.93	55.51	56.10	56.69	57.28	57.86	58.45	59.04	59.62	60.21	60.80	61.39	61.97	62.56	63.15
	Calf	31.21	31.59	31.96	32.34	32.72	33.09	33.47	33.85	34.22	34.60	34.98	35.36	35.73	36.11	36.49	36.86	37.24	37.62	37.99	38.37
82	Upper arm	22.93	23.18	23.43	23.68	23.92	24.17	24.42	24.67	24.91	25.16	25.41	25.65	25.90	26.15	26.40	26.65	26.89	27.14	27.39	27.64
	Forearm	21.91	22.08	22.26	22.43	22.61	22.78	22.96	23.14	23.31	23.49	23.66	23.84	24.01	24.19	24.37	24.54	24.72	24.89	25.07	25.25
	Thigh	51.60	52.19	52.77	53.36	53.95	54.54	55.12	55.71	56.30	56.89	57.47	58.06	58.65	59.23	59.82	60.41	61.00	61.58	62.17	62.76
	Calf	31.06	31.44	31.81	32.19	32.57	32.94	33.32	33.70	34.07	34.45	34.83	35.20	35.58	35.96	36.34	36.71	37.09	37.47	37.84	38.22
81	Upper arm	22.71	22.96	23.21	23.45	23.70	23.95	24.20	24.44	24.69	24.94	25.19	25.43	25.68	25.93	26.18	26.42	26.67	26.92	27.17	27.41
	Forearm	21.78	21.95	22.13	22.30	22.48	22.66	22.83	23.01	23.18	23.36	23.53	23.71	23.89	24.06	24.24	24.41	24.59	24.77	24.94	25.12
	Thigh	51.21	51.80	52.38	52.97	53.56	54.15	54.73	55.32	55.91	56.49	57.08	57.67	58.25	58.84	59.43	60.02	60.61	61.19	61.78	62.37
	Calf	30.91	31.28	31.66	32.04	32.42	32.79	33.17	33.55	33.92	34.30	34.68	35.05	35.43	35.81	36.19	36.56	36.94	37.32	37.69	38.07
80	Upper arm	22.49	22.74	22.98	23.23	23.48	23.73	23.97	24.22	24.47	24.72	24.96	25.21	25.46	25.71	25.95	26.20	26.45	26.70	26.94	27.19
	Forearm	21.65	21.82	22.00	22.18	22.35	22.53	22.70	22.88	23.05	23.23	23.41	23.58	23.76	23.93	24.11	24.29	24.46	24.64	24.81	24.99
	Thigh	50.82	51.41	51.99	52.58	53.17	53.76	54.34	54.93	55.52	56.10	56.69	57.28	57.87	58.45	59.04	59.63	60.22	60.80	61.39	61.98
	Calf	30.76	31.13	31.51	31.89	32.27	32.64	33.02	33.40	33.77	34.15	34.53	34.90	35.28	35.66	36.03	36.41	36.79	37.17	37.54	37.92
79	Upper arm	22.27	22.51	22.76	23.01	23.26	23.50	23.75	24.00	24.25	24.49	24.74	24.99	25.24	25.48	25.73	25.98	26.23	26.47	26.72	26.97
	Forearm	21.52	21.70	21.87	22.05	22.22	22.40	22.57	22.75	22.93	23.10	23.28	23.45	23.63	23.80	23.98	24.16	24.33	24.51	24.68	24.86
	Thigh	50.43	51.02	51.60	52.19	52.78	53.37	53.95	54.54	55.13	55.71	56.30	56.89	57.48	58.06	58.65	59.24	59.82	60.41	61.00	61.59
	Calf	30.61	30.98	31.36	31.74	32.12	32.49	32.87	33.25	33.62	34.00	34.38	34.75	35.13	35.51	35.88	36.26	36.64	37.02	37.39	37.78
78	Upper arm	22.04	22.29	22.54	22.79	23.03	23.28	23.53	23.78	24.02	24.27	24.52	24.77	25.01	25.26	25.51	25.76	26.00	26.25	26.50	26.75
	Forearm	21.39	21.57	21.74	21.92	22.09	22.27	22.45	22.62	22.80	22.97	23.15	23.32	23.50	23.68	23.85	24.03	24.20	24.38	24.56	24.73
	Thigh	50.04	50.63	51.21	51.80	52.39	52.97	53.56	54.15	54.74	55.32	55.91	56.50	57.09	57.67	58.26	58.85	59.43	60.02	60.61	61.20
	Calf	30.46	30.83	31.21	31.59	31.96	32.34	32.72	33.09	33.47	33.85	34.23	34.60	34.98	35.36	35.73	36.11	36.49	36.86	37.24	37.62
77	Upper arm	21.82	22.07	22.31	22.56	22.81	23.06	23.30	23.55	23.80	24.05	24.29	24.54	24.79	25.04	25.28	25.53	25.78	26.03	26.27	26.52
	Forearm	21.26	21.44	21.61	21.79	21.97	22.14	22.32	22.49	22.67	22.84	23.02	23.20	23.37	23.55	23.72	23.90	24.08	24.25	24.43	24.60
	Thigh	49.65	50.24	50.82	51.41	52.00	52.58	53.17	53.76	54.35	54.93	55.52	56.11	56.70	57.28	57.87	58.46	59.04	59.63	60.22	60.81
	Calf	30.31	30.68	31.06	31.44	31.81	32.19	32.57	32.94	33.32	33.70	34.07	34.45	34.83	35.21	35.58	35.96	36.34	36.71	37.09	37.47
76	Upper arm	21.60	21.84	22.09	22.34	22.59	22.83	23.08	23.33	23.58	23.82	24.07	24.32	24.57	24.81	25.06	25.31	25.56	25.80	26.05	26.30
	Forearm	21.13	21.31	21.49	21.66	21.84	22.01	22.19	22.36	22.54	22.72	22.89	23.07	23.24	23.42	23.59	23.77	23.95	24.12	24.30	24.47
	Thigh	49.26	49.84	50.43	51.02	51.61	52.19	52.78	53.37	53.96	54.54	55.13	55.72	56.30	56.89	57.48	58.07	58.65	59.24	59.83	60.42
	Calf	30.16	30.53	30.91	31.29	31.66	32.04	32.42	32.79	33.17	33.55	33.92	34.30	34.68	35.04	35.43	35.81	36.19	36.56	36.94	37.32
75	Upper arm	21.37	21.62	21.87	22.12	22.36	22.61	22.86	23.11	23.35	23.60	23.85	24.10	24.34	24.59	24.84	25.09	25.33	25.58	25.83	26.08
	Forearm	21.01	21.18	21.36	21.53	21.71	21.88	22.06	22.24	22.41	22.59	22.76	22.94	23.11	23.29	23.47	23.64	23.82	23.99	24.17	24.35
	Thigh	48.87	49.45	50.04	50.63	51.22	51.80	52.39	52.98	53.57	54.15	54.74	55.33	55.91	56.50	57.09	57.68	58.26	58.85	59.44	60.03
	Calf	30.00	30.38	30.76	31.13	31.51	31.89	32.27	32.64	33.02	33.40	33.77	34.15	34.53	34.90	35.28	35.66	36.04	36.41	36.79	37.17
74	Upper arm	21.15	21.40	21.65	21.89	22.14	22.39	22.64	22.88	23.13	23.38	23.63	23.87	24.12	24.37	24.62	24.86	25.11	25.36	25.61	25.85
	Forearm	20.88	21.05	21.23	21.40	21.58	21.76	21.93	22.11	22.28	22.46	22.63	22.81	22.99	23.16	23.34	23.51	23.69	23.87	24.04	24.22
	Thigh	48.48	49.06	49.65	50.24	50.83	51.41	52.00	52.59	53.17	53.76	54.35	54.94	55.52	56.11	56.70	57.29	57.87	58.46	59.05	59.63
	Calf	29.85	30.23	30.61	30.98	31.36	31.74	32.12	32.49	32.87	33.25	33.62	34.00	34.38	34.75	35.13	35.51	35.88	36.26	36.64	37.02
73	Upper arm	20.93	21.18	21.42	21.67	21.92	22.17	22.41	22.66	22.91	23.16	23.40	23.65	23.90	24.15	24.39	24.64	24.89	25.14	25.38	25.63
	Forearm	20.75	20.92	21.10	21.28	21.45	21.63	21.80	21.98	22.15	22.33	22.51	22.68	22.86	23.03	23.21	23.38	23.56	23.74	23.91	24.09
	Thigh	48.09	48.67	49.26	49.85	50.44	51.02	51.61	52.20	52.78	53.37	53.96	54.55	55.13	55.72	56.31	56.90	57.48	58.07	58.66	59.24
	Calf	29.70	30.08	30.46	30.83	31.21	31.59	31.96	32.34	32.72	33.10	33.47	33.85	34.23	34.60	34.98	35.36	35.73	36.11	36.49	36.87
72	Upper arm	20.71	20.95	21.20	21.45	21.70	21.94	22.19	22.44	22.69	22.93	23.18	23.43	23.68	23.92	24.17	24.42	24.67	24.91	25.16	25.41
	Forearm	20.62	20.80	20.97	21.15	21.32	21.50	21.67	21.85	22.03	22.20	22.38	22.55	22.73	22.90	23.08	23.26	23.43	23.61	23.78	23.96
	Thigh	47.70	48.28	48.87	49.46	50.04	50.63	51.22	51.81	52.39	52.98	53.57	54.16	54.74	55.33	55.92	56.50	57.09	57.68	58.27	58.85
	Calf	29.55	29.93	30.31	30.68	31.06	31.44	31.81	32.19	32.57	32.94	33.32	33.70	34.08	34.45	34.83	25.21	35.58	35.96	36.34	36.71
71	Upper arm	20.48	20.73	20.98	21.22	21.47	21.72	21.97	22.21	22.46	22.71	22.96	23.20	23.45	23.70	23.95	24.19	24.44	24.69	24.94	25.18
	Forearm	20.49	20.67	20.84	21.02	21.19	21.37	21.55	21.72	21.90	22.07	22.25	22.42	22.60	22.78	22.95	23.13	23.30	23.48	23.66	23.83
	Thigh	47.31	47.89	48.48	49.07	49.65	50.24	50.83	51.42	52.00	52.59	53.18	53.77	54.35	54.94	55.53	56.11	56.70	57.29	57.88	58.46
	Calf	29.40	29.78	30.16	30.53	30.91	31.29	31.66	32.04	32.42	32.79	33.17	33.55	33.93	34.30	34.68	35.06	35.43	35.81	36.19	36.56
70	Upper arm	20.26	20.51	20.75	21.00	21.25	21.50	21.74	21.99	22.24	22.49	22.73	22.98	23.23	23.48	23.72	23.97	24.22	24.47	24.71	24.96
	Forearm	20.36	20.54	20.71	20.89	21.07	21.24	21.42	21.59	21.77	21.94	22.12	22.30	22.47	22.65	22.82	23.00	23.17	23.35	23.53	23.70
	Thigh	46.92	47.50	48.09	48.68	49.26	49.85	50.44	51.03	51.61	52.20	52.79	53.37	53.96	54.55	55.14	55.72	56.31	56.90	57.49	58.07
	Calf	29.25	29.63	30.00	30.38	30.76	31.14	31.51	31.89	32.27	32.64	33.02	33.40	33.77	34.15	34.53	34.91	35.28	35.66	36.04	36.41
69	Upper arm	20.04	20.28	20.53	20.78	21.03	21.27	21.52	21.77	22.02	22.26	22.51	22.76	23.01	23.25	23.50	23.75	24.00	24.24	24.49	24.74
	Forearm	20.23	20.41	20.59	20.76	20.94	21.11	21.29	21.46	21.64	21.82	21.99	22.17	22.34	22.52	22.69	22.87	23.05	23.22	23.40	23.57
	Thigh	46.52	47.11	47.70	48.29	48.87	49.46	50.05	50.64	51.22	51.81	52.40	52.98	53.57	54.16	54.75	55.33	55.92	56.51	57.10	57.68
	Calf	29.10	29.48	29.85	30.23	30.61	30.99	31.36	31.74	32.12	32.49	32.87	33.25	33.62	34.00	34.38	34.75	35.13	35.51	35.89	36.26
68	Upper arm	19.81	20.06	20.31	20.56	20.80	21.05	21.30	21.55	21.79	22.04	22.29	22.54	22.78	23.03	23.28	23.53	23.77	24.02	24.27	24.52
	Forearm	20.10	20.28	20.46	20.63	20.81	20.98	21.16	21.34	21.51	21.69	21.86	22.04	22.21	22.39	22.57	22.74	22.92	23.09	23.27	23.45
	Thigh	46.13	46.72	47.31	47.90	48.48	49.07	49.66	50.25	50.83	51.42	52.01	52.59	53.18	53.77	54.36	54.94	55.53	56.12	56.71	57.29
	Calf	28.95	29.33	29.70	30.08	30.46	30.83	31.21	31.59	31.97	32.34	32.72	33.10	33.47	33.85	34.23	34.60	34.98	35.36	35.74	36.11
67	Upper arm	19.59	19.84	20.09	20.33	20.58	20.83	21.08	21.32	21.57	21.82	22.07	22.31	22.56	22.81	23.06	23.30	23.55	23.80	24.05	24.29
	Forearm	19.98	20.15	20.33	20.50	20.68	20.86	21.03	21.21	21.38	21.56	21.73	21.91	22.09	22.26	22.44	22.61	22.79	22.96	23.14	23.32
	Thigh	45.74	46.33	46.92	47.51	48.09	48.68	49.27	49.85	50.44	51.03	51.62	52.20	52.79	53.38	53.97	54.55	55.14	55.73	56.31	56.90
	Calf	28.80	29.18	29.55	29.93	30.31	30.68	31.06	31.44	31.81	32.19	32.57	32.95	33.32	33.70	34.08	34.45	34.83	35.21	35.58	35.96
66	Upper arm	19.37	19.62	19.86	21.11	20.36	20.61	20.85	21.10	21.35	21.60	21.84	22.09	22.34	22.59	22.83	23.08	23.33	23.58	23.82	24.07
	Forearm	19.85	20.02	20.20	20.38	20.55	20.73	20.90	21.08	21.25	21.43	21.61	21.78	21.96	22.13	22.31	22.48	22.66	22.84	23.01	23.19
	Thigh	45.36	45.94	46.53	47.12	47.70	48.29	48.88	49.46	50.05	50.64	51.23	51.81	52.40	52.99	53.58	54.16	54.75	55.34	55.92	56.51
	Calf	28.65	29.03	29.40	29.78	30.16	30.53	30.91	31.29	31.66	32.04	32.42	32.80	33.17	33.55	33.93	34.30	34.68	35.06	35.43	35.81
65	Upper arm	19.15	19.39	19.64	19.89	20.14	20.38	20.63	20.88	21.13	21.37	21.62	21.87	22.12	22.36	22.61	22.86	23.11	23.35	23.60	23.85
	Forearm	19.72	19.89	20.07	20.25	20.42	20.60	20.77	20.95	21.13	21.30	21.48	21.65	21.83	22.00	22.18	22.36	22.53	22.71	22.88	23.06
	Thigh	44.96	45.55	46.14	46.72	47.31	47.90	48.49	49.07	49.66	50.25	50.84	51.42	52.01	52.60	53.18	53.77	54.36	54.95	55.53	56.12
	Calf	28.50	28.87	29.25	29.63	30.01	30.38	30.76	31.14	31.51	31.69	32.27	32.64	33.02	33.40	33.70	34.15	34.53	34.91	35.28	35.66
64	Upper arm	18.92	19.17	19.42	19.66	19.91	20.16	20.41	20.65	20.90	21.15	21.40	21.64	21.89	22.14	22.39	22.63	22.88	23.13	23.38	23.62
	Forearm	19.59	19.77	19.94	20.12	20.29	20.47	20.65	20.82	21.00	21.17	21.35	21.52	21.70	21.88	22.05	22.23	22.40	22.58	22.75	22.93
	Thigh	44.57	45.16	45.75	46.33	46.92	47.51	48.10	48.68	49.27	49.86	50.45	51.03	51.62	52.21	52.79	53.38	53.97	54.56	55.14	55.73
	Calf	28.35	28.72	29.10	29.48	29.86	30.23	30.61	30.99	31.36	31.74	32.12	32.49	32.87	33.25	33.62	34.00	34.38	34.76	35.13	35.51
63	Upper arm	18.70	18.95	19.19	19.44	19.69	19.94	20.18	20.43	20.68	20.93	21.17	21.42	21.67	21.92	22.16	22.41	22.66	22.91	23.15	23.40
	Forearm	19.46	19.64	19.81	19.99	20.17	20.34	20.52	20.69	20.87	21.04	21.22	21.40	21.57	21.75	21.92	22.10	22.27	22.45	22.63	22.80
	Thigh	44.18	44.77	45.36	45.94	46.53	47.12	47.71	48.29	48.88	49.47	50.05	50.64	51.23	51.82	52.40	52.99	53.58	54.17	54.75	55.34
	Calf	28.20	28.57	28.95	29.33	29.70	30.08	30.46	30.84	31.21	31.59	31.97	32.34	32.72	33.10	33.47	33.85	34.23	34.61	34.98	35.36
62	Upper arm	18.48	18.72	18.97	19.22	19.47	19.71	19.96	20.21	20.46	20.70	20.95	21.20	21.45	21.69	21.94	22.19	22.44	22.68	22.93	23.18
	Forearm	19.33	19.51	19.68	19.86	20.04	20.21	20.39	20.56	20.74	20.92	21.09	21.27	21.44	21.62	21.79	21.97	22.15	22.32	22.50	22.67
	Thigh	43.79	44.38	44.97	45.55	46.14	46.73	47.32	47.90	48.49	49.08	49.66	50.25	50.84	51.43	52.01	52.60	53.19	53.78	54.36	54.95
	Calf	28.05	28.42	28.80	29.18	29.55	29.93	30.31	30.68	31.06	31.44	31.82	32.19	32.57	32.95	33.32	33.70	34.08	34.45	34.83	35.21
61	Upper arm	18.25	18.50	18.75	19.00	19.24	19.49	19.74	19.99	20.23	20.48	20.73	20.98	21.22	21.47	21.72	21.97	22.21	22.46	22.71	22.96
	Forearm	19.20	19.38	19.56	19.73	19.91	20.08	20.26	20.44	20.61	20.79	20.96	21.14	21.31	21.49	21.67	21.84	22.02	22.19	22.37	22.54
	Thigh	43.40	43.99	44.58	45.16	45.75	46.34	46.93	47.51	48.10	48.69	49.27	49.86	50.45	51.04	51.62	52.21	52.80	53.38	53.97	54.56
	Calf	27.90	28.27	28.65	29.03	29.40	29.78	30.16	30.53	30.91	31.29	31.67	32.04	32.42	32.80	33.17	33.55	33.93	34.30	34.68	35.06

Interpolation Table

Chest Circumference	Knee							
	Upper Arm		Forearm		Thigh		Calf	
	0	.1	0	.1	0	.1	0	.1
0	0	.124	0	.088	0	.294	0	.188
.1	.022	.146	.013	.101	.039	.333	.015	.203
.2	.045	.168	.026	.114	.078	.372	.030	.218
.3	.067	.190	.039	.127	.117	.411	.045	.233
.4	.089	.213	.052	.140	.156	.450	.060	.248
.5	.112	.235	.065	.152	.195	.489	.076	.264
.6	.134	.257	.077	.165	.234	.528	.091	.279
.7	.156	.280	.090	.178	.273	.567	.106	.294
.8	.178	.302	.103	.191	.312	.606	.121	.309
.9	.201	.324	.116	.204	.351	.645	.136	.324

Table 140

Average and Minimum Fat and Subcutaneous Tissue Measurements

Age, Years	Chest Front		Chest Back		Abdominal		Supra-iliac		Total Fat			Hip Difference	
	Mean	Minimum	Mean	Minimum	Mean	Minimum	Mean	Minimum	Mean	Minimum	Difference	Mean	Minimum
							Girls						
4	13	10	14	11	14	10	17	12	58	43	15		
5	13	10	14	11	14	10	17	12	58	43	15		
6	13	10	14	11	14	10	17	12	58	43	15		
7	13	10	15	11	14	11	18	12	60	44	17	25	12
8	14	10	16	11	15	11	20	12	65	44	21	26	12
9	14	10	16	11	16	11	21	12	67	44	22	28	12
10	15	10	16	11	17	11	21	12	69	44	25	31	15
11	14	10	16	11	18	11	22	12	70	44	26	34	17
12	15	10	18	11	19	12	22	13	74	46	28	41	20
13	16	11	18	12	19	13	23	13	76	49	27	46	22
14	17	11	19	12	20	13	23	13	79	49	30	48	24
15	17	11	19	13	21	13	25	14	82	51	31	50	26
16	17	11	19	14	22	14	25	15	83	54	29	51	28
17	17	11	20	15	22	15	26	15	85	56	29	51	29
18	22	11	23	15	23	16	26	15	94	57	37	52	29
							Boys						
4	12	9	13	10	13	10	16	10	54	39	15		
5	12	9	13	10	13	10	15	10	53	39	14		
6	12	9	13	11	12	10	15	10	52	40	12		
7	12	9	14	11	12	10	15	10	53	40	13		
8	13	9	14	11	12	10	16	10	55	40	15		
9	13	9	14	11	13	10	16	10	56	40	16		
10	14	9	14	10	13	11	17	11	58	41	17		
11	14	10	14	10	13	11	17	11	58	42	16		
12	14	10	14	10	13	11	17	11	58	42	16		
13	14	10	15	10	14	11	17	11	60	42	18		
14	15	10	15	10	14	11	17	11	61	42	19		
15	15	11	15	11	15	11	17	11	62	44	18		
16	15	11	15	12	15	11	17	11	62	45	17		
17	15	11	16	12	15	12	17	11	63	46	17		
18	16	11	18	12	15	12	19	12	68	47	21		

Table 141

Chinning and Dipping Strength: Boys (Chinning (or Dipping) Strength = 1.77 Weight +3.42 Chins (or Dips) -46)

Weight	Weight, Pounds									
	Values for 1.77 Weight -46									
	0	1	2	3	4	5	6	7	8	9
50	42.5	44.3	46.0	47.8	49.6	51.4	53.1	54.9	56.7	58.4
60	60.2	62.0	63.7	65.5	67.3	69.1	70.8	72.6	74.4	76.1
70	77.9	79.7	81.4	83.2	85.0	86.8	88.5	90.3	92.1	93.8
80	95.6	97.4	99.1	100.9	102.7	104.5	106.2	108.0	109.8	111.5
90	113.3	115.1	116.8	118.6	120.4	122.2	123.9	125.7	127.5	129.2
100	131.0	132.8	134.5	136.3	138.1	139.9	141.6	143.4	145.2	146.9
110	148.7	150.5	152.2	154.0	155.8	157.6	159.3	161.1	162.9	164.6
120	166.4	168.2	169.9	171.7	173.5	175.3	177.0	178.8	180.6	182.3
130	184.1	185.9	187.6	189.4	191.2	193.0	194.7	196.5	198.3	200.0
140	201.8	203.6	205.3	207.1	208.9	210.7	212.4	214.2	216.0	217.7
150	219.5	221.3	223.0	224.8	226.6	228.4	230.1	231.9	233.7	235.4
160	237.2	239.0	240.7	242.5	244.3	246.1	247.8	249.6	251.4	253.1
170	254.9	256.7	258.4	260.2	262.0	263.8	265.5	267.3	269.1	270.8
180	272.6	274.4	276.1	277.9	279.7	281.5	283.2	285.0	286.8	288.5
190	290.3	292.1	293.8	295.6	297.4	299.2	300.9	302.7	304.5	306.2
200	308.0	309.8	311.5	313.3	315.1	316.9	318.6	320.4	322.2	323.9

Chins	Chins									
	Values for 3.42									
	0	1	2	3	4	5	6	7	8	9
0	0.0	3.4	6.8	10.3	13.7	17.1	20.5	23.9	27.4	30.8
10	34.2	37.6	41.0	44.5	47.9	51.3	54.7	58.1	61.6	65.0
20	68.4	71.8	75.2	78.7	82.1	85.5	88.9	92.3	95.8	99.2
30	102.6	106.0	109.4	112.0	116.3	119.7	123.1	126.5	130.0	133.4

Table 142

Norms for Total Strength Index: Boys*

Weight	Age, Years													
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
218									2127	2126	2125	2148	2171	2207	2243
216									2110	2110	2110	2133	2156	2191	2227
214								2097	2093	2093	2094	2117	2140	2175	2210
212								2079	2075	2077	2078	2101	2124	2159	2193
210								2061	2058	2060	2062	2086	2109	2143	2176
208								2043	2041	2044	2046	2070	2093	2126	2159
206							2028	2025	2024	2027	2031	2054	2078	2110	2143
204							2009	2007	2007	2011	2015	2038	2062	2094	2126
202							1990	1989	1989	1994	1999	2023	2046	2078	2109
200							1971	1971	1972	1978	1983	2007	2031	2062	2092
198						1923	1952	1953	1955	1961	1967	1991	2015	2045	2075
196						1904	1933	1935	1938	1945	1952	1976	2000	2029	2059
194						1885	1914	1917	1921	1928	1936	1960	1984	2013	2042
192						1866	1895	1899	1903	1912	1920	1944	1968	1997	2025
190					1818	1847	1876	1881	1886	1895	1904	1929	1953	1981	2008
188					1800	1829	1857	1863	1869	1879	1888	1913	1937	1964	1991
186					1781	1810	1838	1845	1852	1862	1873	1897	1922	1948	1975
184					1763	1791	1819	1827	1835	1846	1857	1881	1906	1932	1958
182				1697	1744	1772	1801	1809	1817	1829	1841	1866	1890	1916	1941
180				1679	1725	1753	1782	1791	1800	1813	1825	1850	1875	1900	1924
178				1661	1707	1735	1763	1772	1783	1796	1809	1834	1859	1883	1907
176				1643	1688	1716	1744	1755	1766	1780	1794	1819	1844	1867	1891
174			1580	1625	1669	1697	1726	1737	1749	1763	1778	1803	1828	1851	1874
172			1563	1607	1650	1678	1706	1719	1731	1747	1762	1787	1812	1835	1857
170			1545	1588	1632	1659	1687	1700	1714	1730	1746	1772	1797	1819	1840
168			1528	1570	1613	1641	1668	1682	1697	1714	1730	1756	1781	1802	1823
166		1493	1510	1552	1594	1622	1649	1664	1680	1697	1716	1740	1766	1786	1807
164		1477	1493	1534	1576	1603	1630	1646	1663	1681	1699	1724	1750	1770	1790
162		1461	1475	1516	1557	1584	1612	1628	1645	1664	1683	1709	1734	1754	1773
160		1399	1458	1498	1538	1565	1593	1610	1628	1648	1667	1693	1719	1738	1756
158	1328	1383	1440	1480	1520	1547	1574	1592	1611	1631	1651	1677	1703	1721	1739
156	1313	1367	1423	1462	1501	1528	1555	1574	1594	1615	1636	1662	1688	1705	1723
154	1298	1351	1405	1444	1482	1509	1536	1555	1577	1598	1620	1646	1672	1689	1706
152	1283	1334	1388	1426	1463	1490	1517	1537	1559	1582	1604	1630	1656	1673	1689
150	1268	1318	1370	1407	1445	1471	1498	1519	1542	1565	1588	1615	1641	1657	1672

Table 142 (Continued)

Norms for Total Strength Index: Boys*

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
148	1253	1302	1363	1389	1426	1453	1479	1502	1525	1549	1572	1599	1625	1640	1655
146	1238	1286	1335	1371	1407	1434	1460	1484	1508	1532	1557	1583	1610	1624	1639
144	1223	1269	1318	1353	1389	1415	1441	1466	1491	1516	1541	1567	1594	1608	1622
142	1208	1253	1300	1335	1370	1396	1423	1448	1473	1499	1525	1552	1578	1592	1605
140	1193	1237	1283	1317	1351	1377	1404	1430	1456	1483	1509	1536	1563	1576	1588
138	1178	1221	1265	1299	1333	1359	1385	1412	1439	1466	1493	1520	1547	1559	1571
136	1163	1204	1248	1281	1314	1340	1366	1394	1422	1450	1478	1505	1532	1543	1555
134	1148	1188	1230	1263	1295	1321	1347	1376	1405	1433	1462	1489	1516	1527	1538
132	1133	1172	1213	1245	1276	1302	1328	1358	1387	1417	1446	1473	1500	1511	1521
130	1118	1156	1195	1226	1258	1283	1309	1340	1370	1400	1430	1458	1483	1495	1504
128	1103	1140	1178	1208	1239	1265	1290	1321	1353	1384	1414	1442	1469	1478	1487
126	1088	1123	1160	1190	1220	1246	1271	1303	1336	1367	1399	1426	1454	1462	1471
124	1073	1107	1143	1172	1202	1227	1252	1285	1319	1351	1383	1410	1438	1446	1454
122	1058	1091	1125	1154	1183	1208	1234	1267	1301	1334	1367	1395	1422	1430	1437
120	1043	1075	1108	1136	1164	1189	1215	1249	1284	1318	1351	1379	1407	1414	1420
118	1028	1058	1090	1118	1146	1171	1190	1231	1267	1301	1335	1363	1391	1397	1404
116	1013	1042	1073	1100	1127	1152	1177	1213	1250	1285	1320	1348	1376	1381	1387
114	998	1026	1055	1082	1108	1133	1158	1195	1233	1268	1304	1332	1360	1365	1370
112	983	1010	1038	1064	1089	1114	1139	1177	1215	1252	1288	1316	1344	1348	1353
110	968	993	1020	1045	1071	1095	1120	1159	1198	1235	1272	1301	1328	1332	1336
108	953	977	1003	1027	1052	1077	1101	1141	1181	1219	1256	1285	1313	1316	
106	938	961	985	1009	1033	1058	1082	1123	1164	1202	1241	1269	1297	1300	
104	923	945	968	991	1015	1039	1063	1105	1147	1186	1225	1253	1282		
102	908	928	950	973	996	1020	1045	1087	1129	1169	1209	1238	1266		
100	893	912	933	955	977	1001	1026	1069	1112	1153	1193	1222			
98	878	896	915	937	959	983	1007	1051	1095	1136	1177	1206			
96	863	880	898	919	940	964	988	1033	1078	1120	1161				
94	848	863	880	901	921	945	969	1015	1061	1103	1146				
92	833	847	863	883	902	926	950	996	1043	1087					
90	818	831	845	864	884	907	931	979	1026	1070					
88	803	815	828	846	865	889	912	961	1009						
86	788	798	810	828	846	870	893	943	992						
84	773	783	793	810	828	851	874	925							
82	758	767	776	792	809	832	855	916							
80	743	751	758	774	791	813	836								

Table 142 (Continued)

Norms for Total Strength Index: Boys*

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
78	728	734	741	756	772	795	817								
76	713	718	723	738	753	776									
74	698	702	706	720	735	757									
72	683	686	688	701	716										
70	668	669	671	683	697										
68	653	653	653	665											
66	638	637	636	647											
64	623	621	618												
62	608	604	601												
60	593	588													
Multiplier	7.50	8.12	8.75	9.05	9.35	9.40	9.45	9.02	8.60	8.25	7.90	7.85	7.80	8.10	8.40

*The Total Strength Index in Tables and is the sum of the unweighted strength of the right grip, the left grip, the back lift, the leg lift, and dipping and chinning strengths. The first four are administered according to the directions given by Rogers ( ); the dipping (parallel bars) and chinning strengths for boys are scored according to the formula shown in Tables and . To interpret this index in terms of individual muscular condition divide the actual Total Strength Index x 100 by the norm for age and weight. The result is a form of the "Physical Fitness Index."

Table 143

Norms for Strength Index. (With Breathing Capacity): Boys*

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
218									2489	2497	2512	2525	2542	2540	2540
216									2469	2477	2493	2506	2524	2522	2522
214								2447	2448	2458	2474	2488	2505	2504	2504
212								2426	2428	2438	2454	2469	2487	2486	2487
210								2405	2407	2418	2435	2450	2468	2468	2469
208								2383	2387	2398	2416	2431	2450	2450	2452
206							2361	2362	2367	2378	2397	2412	2432	2432	2434
204							2339	2340	2346	2359	2378	2394	2413	2414	2416
202							2317	2319	2326	2339	2358	2375	2395	2396	2399
200							2294	2298	2306	2319	2339	2356	2376	2378	2381
198						2232	2272	2276	2285	2299	2320	2337	2358	2360	2364
196						2210	2250	2255	2265	2279	2301	2318	2340	2342	2346
194						2188	2228	2233	2244	2260	2282	2300	2321	2324	2328
192						2166	2206	2212	2224	2240	2262	2281	2303	2306	2311
190					2108	2144	2184	2191	2203	2220	2243	2262	2284	2288	2293
188					2086	2122	2162	2169	2183	2200	2224	2243	2266	2270	2276
186					2064	2100	2139	2147	2163	2180	2205	2224	2248	2252	2258
184					2042	2078	2117	2126	2142	2161	2186	2206	2229	2234	2240
182				1962	2020	2056	2095	2105	2122	2141	2166	2187	2211	2216	2223
180				1941	1999	2034	2073	2084	2102	2121	2147	2168	2192	2198	2205
178				1920	1977	2012	2051	2062	2081	2101	2128	2149	2174	2180	2188
176				1899	1955	1990	2028	2041	2061	2081	2109	2130	2156	2162	2170
174			1820	1878	1933	1968	2006	2019	2040	2062	2090	2112	2137	2144	2152
172			1800	1857	1911	1946	1984	1998	2020	2042	2070	2093	2119	2126	2135
170			1780	1836	1890	1924	1961	1976	1999	2022	2051	2074	2100	2108	2117
168			1760	1815	1868	1902	1940	1955	1979	2002	2032	2055	2082	2090	2100
166		1635	1740	1794	1846	1880	1917	1934	1959	1982	2013	2036	2064	2072	2082
164		1617	1720	1773	1824	1858	1895	1912	1938	1963	1994	2018	2045	2054	2064
162		1599	1700	1752	1802	1836	1873	1891	1918	1943	1974	1999	2027	2036	2047
160		1582	1680	1731	1781	1814	1851	1869	1898	1923	1955	1980	2008	2018	2029
158	1472	1564	1660	1710	1759	1792	1829	1848	1877	1903	1936	1961	1990	2000	2012
156	1457	1546	1640	1689	1737	1770	1806	1827	1857	1883	1917	1942	1972	1982	1994
154	1441	1528	1620	1668	1715	1748	1784	1805	1836	1864	1897	1924	1953	1964	1976
152	1426	1510	1600	1647	1693	1726	1762	1784	1816	1844	1878	1905	1935	1946	1959
150	1410	1493	1580	1626	1672	1704	1740	1762	1796	1824	1859	1886	1916	1928	1941

Table 143 (Continued)

Norms for Strength Index (With Breathing Capacity): Boys*

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
148	1395	1475	1560	1605	1650	1682	1718	1741	1775	1804	1840	1867	1898	1910	1924
146	1380	1457	1540	1584	1628	1660	1695	1720	1755	1784	1821	1848	1880	1892	1906
144	1364	1439	1520	1563	1606	1638	1673	1698	1734	1765	1801	1830	1861	1874	1888
142	1349	1421	1500	1542	1584	1616	1651	1677	1714	1745	1782	1811	1843	1856	1871
140	1333	1404	1480	1521	1563	1594	1629	1656	1694	1725	1763	1792	1824	1838	1853
138	1318	1386	1460	1500	1541	1572	1607	1634	1673	1705	1744	1773	1806	1820	1836
136	1303	1368	1440	1479	1519	1550	1584	1613	1653	1685	1725	1754	1788	1802	1818
134	1287	1350	1420	1458	1497	1528	1562	1591	1632	1666	1705	1736	1769	1784	1800
132	1272	1332	1400	1437	1475	1506	1540	1570	1612	1646	1686	1717	1751	1766	1783
130	1256	1315	1380	1415	1454	1484	1518	1548	1592	1626	1667	1698	1732	1748	1765
128	1241	1297	1360	1395	1432	1462	1496	1527	1571	1606	1648	1679	1714	1730	1748
126	1226	1279	1340	1374	1410	1440	1473	1506	1551	1586	1629	1660	1696	1712	1730
124	1210	1261	1320	1353	1388	1418	1451	1484	1530	1567	1610	1642	1677	1694	1712
122	1195	1243	1300	1332	1366	1396	1429	1463	1510	1547	1590	1623	1659	1676	1695
120	1179	1226	1280	1311	1346	1374	1407	1441	1489	1527	1571	1604	1640	1658	1677
118	1164	1208	1260	1290	1323	1352	1385	1420	1469	1507	1552	1585	1622	1640	1660
116	1149	1190	1240	1269	1301	1330	1362	1398	1449	1488	1533	1566	1604	1622	1642
114	1133	1172	1220	1248	1279	1308	1340	1377	1428	1468	1514	1548	1585	1604	1624
112	1118	1154	1200	1227	1257	1286	1318	1356	1408	1448	1494	1529	1567	1586	1607
110	1102	1137	1180	1206	1236	1264	1296	1335	1388	1428	1475	1510	1548	1568	1589
108	1087	1119	1160	1185	1214	1242	1274	1313	1367	1408	1456	1491	1530	1550	
106	1072	1101	1140	1164	1192	1220	1251	1292	1347	1388	1437	1472	1512	1532	
104	1056	1083	1120	1143	1170	1198	1229	1270	1326	1369	1418	1454	1493		
102	1040	1065	1100	1122	1148	1176	1207	1249	1306	1349	1398	1435	1475		
100	1025	1048	1080	1101	1127	1154	1185	1228	1286	1329	1379	1416			
98	1010	1030	1060	1080	1105	1132	1163	1206	1265	1309	1360	1397			
96	995	1012	1040	1059	1083	1110	1141	1184	1245	1289	1341				
94	979	994	1020	1038	1061	1088	1118	1163	1224	1269	1322				
92	964	977	1000	1017	1040	1066	1096	1142	1204	1250					
90	948	959	980	996	1018	1044	1074	1120	1183	1230					
88	933	941	960	975	996	1022	1052	1099	1163						
86	917	923	940	954	974	1000	1030	1078	1143						
84	902	905	920	933	952	978	1008	1057							
82	886	887	900	912	930	956	986	1035							
80	871	870	880	891	909	934	963								

Table 143 (Continued)

Norms for Strength Index (With Breathing Capacity): Boys*

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
78	855	852	860	870	887	912	941								
76	840	834	840	849	865	890									
74	825	816	820	828	843	868									
72	809	798	800	807	821										
70	794	781	780	786	800										
68	778	763	760	765											
66	763	745	740	744											
64	748	727	720												
62	732	709	700												
60	717	692													
Multiplier	7.7	8.9	10.0	10.5	10.9	11.0	11.1	10.7	10.2	9.9	9.6	9.4	9.2	9.0	8.8

*This index is the same as the Total Strength Index (Tables and) but with breathing capacity of the lungs in cubic inches added as one of the test elements. The addition of breathing capacity adds little or nothing to the value of the test as a strength test, but it is probably of some value in the prediction of general physical condition.

Table 144

Norms for the "Athletic Strength Index"*
(Short Form, Boys Only)

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
218									703	706	710	714	719	722	725
216									696	700	704	709	714	716	720
214								692	690	694	698	703	708	711	715
212								685	683	688	692	697	703	705	709
210								678	677	681	687	692	697	700	704
208								671	671	675	681	686	692	695	699
206							666	665	664	669	675	680	686	689	693
204							659	658	658	663	669	674	681	684	688
202							652	651	651	657	663	669	675	678	683
200							645	645	645	651	657	663	670	673	677
198						625	638	638	639	645	651	657	664	668	672
196						618	631	631	632	638	645	652	659	662	667
194						611	624	625	626	632	639	646	653	657	662
192						604	617	618	620	626	633	640	648	651	656
190					584	597	610	611	613	620	628	635	642	646	651
188					577	590	602	604	607	614	622	629	637	641	646
186					570	583	595	598	600	608	616	623	631	635	640
184					563	576	588	591	594	601	610	617	626	630	635
182				529	556	569	581	584	588	595	604	612	620	624	630
180				522	549	562	574	578	581	589	598	606	615	619	624
178				516	542	555	567	571	575	583	592	600	609	614	619
176				510	535	548	560	564	568	577	586	595	604	608	614
174			478	503	528	541	553	557	562	571	580	589	598	603	609
172			472	497	521	534	546	551	556	565	574	583	593	597	603
170			466	490	514	527	539	544	549	558	569	578	587	592	598
168			460	484	507	520	532	537	543	552	563	572	582	587	593
166		409	454	477	500	513	525	530	536	546	557	566	576	581	587
164		404	448	471	494	506	518	524	530	540	551	560	571	576	582
162		399	442	464	487	499	511	517	524	534	545	555	565	570	577
160		393	436	458	480	492	504	510	517	528	539	549	560	565	571
158	347	388	430	451	473	485	497	504	511	522	533	543	554	560	566
156	343	383	424	455	466	478	490	497	504	515	527	538	549	554	561
154	339	378	418	438	459	471	483	490	498	509	521	532	543	549	556
152	335	373	412	432	452	464	476	483	492	503	515	526	538	543	550
150	331	368	406	425	445	457	469	477	485	497	510	521	532	538	545

Table 144 (Continued)

Norms for the "Athletic Strength Index"*
(Short Form, Boys Only)

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
148	327	363	400	419	438	450	462	470	479	491	504	515	527	533	540
146	322	358	393	413	431	443	455	463	472	485	498	509	521	527	534
144	318	353	387	406	425	436	448	457	466	478	492	503	516	522	529
142	314	348	381	400	418	429	441	450	460	472	486	498	510	516	524
140	310	343	375	393	411	422	434	443	453	466	480	492	505	511	518
138	306	338	369	387	404	415	426	436	447	460	474	486	499	506	513
136	302	333	363	380	397	408	419	430	440	454	468	481	494	500	508
134	298	327	357	374	390	401	412	423	434	448	462	475	488	495	503
132	294	322	351	367	383	394	405	416	428	442	456	469	483	489	497
130	290	317	345	361	376	388	398	410	421	435	451	464	477	484	492
128	286	312	339	354	369	381	391	403	415	429	445	458	472	479	487
126	281	307	333	348	362	374	384	396	408	423	439	452	466	473	481
124	277	302	327	341	356	367	377	389	402	417	433	446	461	468	476
122	273	297	321	335	349	360	370	383	396	411	427	441	455	462	471
120	269	292	315	328	342	353	363	376	389	405	421	435	450	457	465
118	265	287	309	322	335	346	356	369	383	399	415	429	444	452	460
116	261	282	303	315	328	339	349	362	376	392	409	424	439	446	455
114	257	277	296	309	321	332	342	356	370	386	403	418	433	441	450
112	253	272	290	302	314	325	335	349	364	380	397	412	428	435	444
110	249	266	284	296	307	318	328	342	357	374	392	407	422	430	439
108	245	261	278	289	300	311	321	336	351	368	386	401	417	425	
106	240	256	272	283	293	304	314	329	344	362	380	395	411	419	
104	236	251	266	276	287	297	307	322	338	355	374	389	406		
102	232	246	260	270	280	290	300	315	332	349	368	384	400		
100	228	241	254	263	273	283	293	309	325	343	362	378			
98	224	236	248	257	266	276	286	302	319	337	356	372			
96	220	231	242	251	259	269	279	295	313	331	350				
94	216	226	236	244	252	262	272	289	306	325	344				
92	212	221	230	238	245	255	265	282	300	319					
90	208	216	224	231	238	248	258	275	293	312					
88	204	211	218	225	232	241	251	268	287						
86	199	206	212	218	225	234	244	262	281						
84	195	201	206	212	216	227	237	255							
82	191	196	200	205	211	220	230	249							
80	186	191	194	199	204	213	223								

Table 144 (Continued)

Norms for the "Athletic Strength Index"*
(Short Form, Boys Only)

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
78	183	186	188	192	197	206	216								
76	179	181	182	186	191	199									
74	174	176	176	179	184	192									
72	170	170	170	173	177										
70	166	165	164	166	170										
68	162	160	157	160											
66	158	155	151	153											
64	154	150	145												
62	150	145	139												
60	146	140													
Multiplier	2.05	2.54	3.03	3.24	3.45	3.49	3.52	3.36	3.20	3.07	2.95	2.85	2.75	2.70	2.65

*This short form is composed of: (the sum of grip strength) + 2 (chinning strength) + 1 (dipping strength) - 3 (weight). To interpret the short form of the Athletic Strength Index in terms of relative individual athletic ability, divide the actual Athletic Strength Index x 100 by the norm for age and weight. The result is a form of the "Athletic Fitness Index." It indicates relative athletic fitness, in so far as this is dependent on muscular strength. This short form is nearly as accurate a test as the longer Strength Index.

Table 145

Norms for Chinning Strength*
(Boys Only)

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
218									357	357	355	355	355	355	354
216									353	353	352	352	352	352	351
214								351	350	350	349	349	349	349	348
212								348	347	346	345	345	346	346	345
210								344	343	343	342	342	343	343	342
208								341	340	340	339	339	340	340	339
206							339	337	336	336	336	336	337	337	336
204							335	334	333	333	333	333	333	333	333
202							332	330	330	330	329	329	330	330	330
200							328	327	326	326	326	326	327	327	327
198						322	325	324	323	323	323	323	324	324	324
196						319	321	321	320	320	320	320	321	321	321
194						315	318	317	316	316	317	317	318	318	318
192						312	314	314	313	313	313	314	315	315	315
190					306	308	310	310	310	310	310	311	312	312	312
188					302	304	307	307	306	306	307	308	309	309	309
186					299	301	303	303	303	303	304	305	306	306	306
184					295	297	300	300	300	300	301	302	303	303	303
182				288	292	294	296	296	296	296	297	298	300	300	300
180				284	288	290	292	292	293	293	294	295	297	297	297
178				281	285	287	289	289	289	290	291	292	293	293	294
176				277	281	283	285	285	286	287	288	289	290	290	291
174			270	274	278	280	282	282	283	284	285	286	287	287	288
172			267	270	274	276	278	278	279	280	281	282	284	284	285
170			263	267	271	273	275	275	276	277	278	279	281	281	282
168			260	263	267	269	271	272	273	274	275	277	278	278	279
166		251	257	260	264	266	268	268	269	270	272	273	275	275	276
164		248	253	256	260	262	264	265	266	267	269	270	272	272	273
162		245	250	253	257	259	261	262	263	264	265	267	269	269	270
160		241	246	249	253	255	257	258	259	260	262	264	266	266	267
158	233	238	243	246	250	252	254	255	256	257	259	261	263	263	264
156	230	235	240	243	246	248	250	251	252	254	256	258	260	260	261
154	227	231	236	239	243	245	247	248	249	251	253	254	256	257	258
152	224	228	233	236	239	241	243	244	246	247	249	251	253	254	255
150	221	225	230	233	236	238	240	241	242	244	246	248	250	251	252

Table 145 (Continued)

Norms for Chinning Strength*
(Boys Only)

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
148	218	222	226	229	232	234	236	237	239	241	243	245	247	248	249
146	214	219	223	226	229	231	233	234	236	238	240	242	244	245	246
144	211	215	219	222	225	227	229	230	232	234	237	239	241	242	243
142	208	212	216	219	222	224	226	227	229	231	233	235	238	239	240
140	205	209	213	215	218	220	222	224	226	228	230	232	235	236	237
138	202	205	209	212	215	217	219	220	222	224	227	229	232	233	234
136	199	202	206	208	211	213	215	217	219	221	224	226	229	230	231
134	195	199	203	205	208	210	212	214	216	218	221	223	226	227	228
132	192	195	199	201	204	206	208	210	212	214	217	220	223	224	225
130	189	192	196	198	201	202	204	206	209	211	214	217	220	221	222
128	186	189	192	194	197	199	201	203	205	208	211	213	216	217	219
126	183	186	189	191	194	195	197	199	202	205	208	210	213	214	216
124	180	183	186	188	190	192	194	196	199	202	205	207	210	211	213
122	176	179	182	184	187	188	190	192	195	198	201	204	207	208	210
120	173	176	179	181	183	185	187	189	192	195	198	201	204	205	207
118	170	172	175	177	180	181	183	186	189	192	195	198	201	202	204
116	167	169	172	174	176	178	180	182	185	188	192	195	198	199	201
114	164	166	169	171	173	174	176	179	182	185	189	192	195	196	198
112	161	163	165	167	169	171	173	176	179	182	185	188	192	193	195
110	158	160	162	164	166	167	169	172	175	178	182	185	189	190	192
108	154	156	159	160	162	164	166	169	172	175	179	182	186	187	
106	151	153	155	157	159	160	162	165	168	172	176	179	183	184	
104	148	150	152	153	155	157	159	162	165	169	173	175	179		
102	145	146	148	150	152	153	155	158	162	165	169	172	176		
100	142	143	145	146	148	149	152	155	158	162	166	169			
98	139	140	142	143	145	146	148	151	155	159	163	166			
96	136	137	139	140	142	142	144	148	152	156	160				
94	133	133	135	136	138	139	141	144	148	152	157				
92	130	130	132	133	135	135	137	141	145	149					
90	126	127	128	129	131	132	134	137	142	146					
88	123	124	125	126	128	128	130	134	138						
86	120	120	122	122	124	125	127	130	135						
84	117	117	119	119	121	121	123	127							
82	114	113	115	115	117	118	120	123							
80	111	110	112	112	114	114	116								

Table 145 (Continued)

Norms for Chinning Strength*
(Boys Only)

Weight	Age, Years														
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17	17½	18
78	107	107	108	108	110	111	113								
76	104	104	105	105	107	107									
74	101	100	102	101	103	104									
72	98	97	98	98	99										
70	95	94	95	94	96										
68	92	90	92	91											
66	88	87	88	88											
64	85	84	85												
62	82	81	81												
60	79	77													
Multiplier	1.58	1.64	1.69	1.72	1.75	1.76	1.76	1.72	1.68	1.64	1.60	1.57	1.54	1.52	1.50

*Chinning strength is computed by the formula: 1.77 (weight in pounds) + 3.42 (number of chins) - 46. To interpret this index in terms of individual muscular condition, divide the actual chinning strength x 100 by the norm for age and weight. The result is an index for relative chinning strength.

Table 146

Chinning Strength: Girls (Chinning Strength = .67 Weight +1.2 Chins +52)

Weight	Weight, Pounds Values for -.67 Weight +52									
	0	1	2	3	4	5	6	7	8	9
50	85.50	86.17	86.84	87.51	88.18	88.35	89.52	90.19	90.86	91.53
60	92.20	92.87	93.54	94.21	94.88	95.55	96.22	96.89	97.56	98.23
70	98.90	99.57	100.24	100.91	101.58	102.25	102.92	103.59	104.26	104.93
80	105.60	106.27	106.94	107.61	108.28	108.95	109.62	110.29	110.96	111.63
90	112.30	112.97	113.64	114.31	114.98	115.65	116.32	116.99	117.66	118.33
100	119.00	119.67	120.34	121.01	121.68	122.35	123.02	123.69	124.36	125.03
110	125.70	126.37	127.04	127.71	128.38	129.05	129.72	130.39	121.06	131.73
120	132.40	133.07	133.74	134.41	135.08	135.75	136.42	137.09	137.76	138.43
130	139.10	139.77	140.44	141.11	141.78	142.45	143.12	143.79	144.46	145.13
140	145.80	146.47	147.14	147.81	148.48	149.15	149.82	150.49	151.16	151.83
150	152.50	153.17	153.84	154.51	155.18	155.85	156.52	157.19	157.86	158.53
160	159.20	159.87	160.54	161.21	161.88	162.55	163.22	163.89	164.56	165.23
170	165.90	166.57	167.24	167.91	168.58	169.25	169.92	170.59	171.26	171.93

Chins	Chins Values for -1.2									
	0	1	2	3	4	5	6	7	8	9
0	0.0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8
10	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8
20	24.0	25.2	26.4	27.6	28.8	30.0	31.2	32.4	33.6	34.8
30	36.0	37.2	38.4	39.6	40.8	42.0	43.2	44.4	45.6	46.8
40	48.0	49.2	50.4	51.6	52.8	54.0	55.2	56.4	57.6	58.8
50	60.0	61.2	62.4	63.6	64.8	66.0	67.2	68.4	69.6	70.8
60	72.0	73.2	74.4	75.6	76.8	78.0	79.2	80.4	81.6	82.8
70	84.0	85.2	86.4	87.6	88.8	90.0	91.2	92.4	93.6	94.8

Table 147

Dipping Strength: Girls (Dipping Strength = .78 Weight +1.1 Dips +74)

Weight	Weight, Pounds Values for -.78 Weight +74									
	0	1	2	3	4	5	6	7	8	9
50	113.00	113.78	114.56	115.34	116.12	116.90	117.68	118.46	119.24	120.02
60	120.80	121.58	122.36	123.14	123.92	124.70	125.48	126.26	127.04	127.82
70	128.60	129.38	130.16	130.94	131.72	132.50	133.28	134.06	134.84	135.62
80	136.40	137.18	137.96	138.74	139.52	140.30	141.08	141.86	142.64	143.42
90	144.20	144.98	145.76	146.54	147.32	148.10	148.88	149.66	150.44	151.22
100	152.00	152.78	153.56	154.34	155.12	155.90	156.68	157.46	158.24	159.02
110	159.80	160.58	161.36	162.14	162.92	163.70	164.48	165.26	166.04	166.82
120	167.60	168.38	169.16	169.94	170.72	171.50	172.28	173.06	173.84	174.62
130	175.40	176.18	176.96	177.74	178.52	179.30	180.08	180.86	181.64	182.42
140	183.20	183.98	184.76	185.54	186.32	187.10	187.88	188.66	189.44	190.22
150	191.00	191.78	192.56	193.34	194.12	194.90	195.68	196.46	197.24	198.02
160	198.80	199.58	200.36	201.14	201.92	202.70	203.48	204.26	205.04	205.82
170	206.60	207.38	208.16	208.94	209.72	210.50	211.28	212.06	212.84	213.62

Dip	Dip Values for -1.1									
	0	1	2	3	4	5	6	7	8	9
0	0.0	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	[illegible]
10	11.0	12.1	13.2	14.3	15.4	16.5	17.6	18.7	[illegible]	[illegible]
20	22.0	23.1	24.2	25.3	26.4	27.5	28.6	29.7	30.8	[illegible]
30	33.0	34.1	35.2	36.3	37.4	38.5	39.6	40.7	41.8	[illegible]
40	44.0	45.1	46.2	47.3	48.4	49.5	50.6	51.7	[illegible]	[illegible]
50	55.0	56.1	57.2	58.3	59.4	60.5	61.6	62.7	[illegible]	[illegible]

Table 148

Total Strength Index on Weight: Girls*

Weight	Age, Years												
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17
180								1259	1262	1269	1276	1269	1262
178								1251	1255	1262	1269	1262	1255
176								1243	1248	1255	1262	1255	1248
174							1229	1235	1240	1248	1255	1248	1242
172							1221	1227	1233	1241	1248	1241	1235
170							1212	1219	1226	1234	1241	1235	1228
168							1204	1212	1219	1226	1234	1228	1222
166						1171	1195	1204	1212	1219	1227	1221	1215
164						1162	1187	1196	1204	1212	1220	1214	1208
162						1153	1178	1188	1197	1205	1213	1207	1202
160						1145	1170	1180	1190	1198	1206	1201	1195
158					1109	1136	1161	1172	1183	1191	1199	1194	1188
156					1100	1127	1152	1164	1176	1184	1192	1187	1182
154					1091	1118	1144	1156	1168	1177	1185	1180	1175
152					1082	1110	1135	1149	1161	1170	1178	1173	1168
150				1050	1073	1101	1127	1141	1154	1163	1171	1166	1162
148				1041	1064	1092	1118	1133	1147	1155	1164	1160	1155
146				1032	1055	1083	1110	1125	1140	1148	1157	1153	1148
144				1023	1046	1074	1101	1117	1132	1141	1150	1146	1142
142			990	1014	1037	1066	1093	1109	1125	1134	1143	1139	1135
140			981	1005	1028	1057	1084	1101	1128	1127	1136	1132	1129
138			972	996	1019	1048	1076	1093	1111	1120	1129	1125	1122
136			963	987	1010	1039	1067	1085	1104	1113	1122	1119	1115
134		935	954	978	1001	1030	1059	1078	1096	1106	1115	1112	1109
132		927	945	969	992	1021	1050	1070	1089	1099	1108	1105	1102
130		918	937	960	983	1012	1041	1062	1082	1092	1101	1098	1095
128		910	928	951	974	1004	1033	1054	1075	1084	1094	1091	1086
126	884	902	919	942	965	995	1024	1046	1068	1077	1087	1084	1082
124	877	893	910	933	956	986	1016	1038	1060	1070	1080	1078	1075
122	869	885	901	924	947	977	1007	1030	1053	1063	1073	1071	1069
120	861	876	892	915	938	969	999	1022	1046	1056	1066	1064	1062
118	853	868	883	906	929	960	990	1015	1039	1049	1059	1057	1055
116	845	860	874	897	920	951	982	1007	1032	1042	1052	1050	1049
114	837	851	865	888	911	942	973	999	1024	1035	1045	1043	1042
112	829	843	856	879	902	933	965	991	1017	1028	1038	1037	1035
110	821	834	848	870	893	925	956	983	1010	1021	1031	1030	1029

Table 148 (Continued)

Total Strength Index on Weight: Girls*

Weight	Age, Years												
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17
108	813	826	839	862	884	916	947	975	1003	1013	1024	1023	1022
106	805	818	830	853	875	907	949	967	996	1006	1017	1016	1015
104	798	809	821	844	866	898	930	959	988	999	1010	1009	1009
102	790	801	812	835	857	890	922	952	981	992	1003	1002	1002
100	782	792	803	826	848	881	913	944	974	985	996	996	995
98	774	784	794	817	839	872	905	936	967	978	989	989	988
96	766	776	785	808	830	863	896	928	960	971	982	982	982
94	758	767	776	799	821	855	888	920	952	964	975	975	975
92	750	759	767	790	812	846	879	912	945	957	968	968	968
90	742	750	759	781	803	837	871	904	938	950	961	961	962
88	734	742	750	772	794	828	862	896	931	942	954	954	
86	726	734	741	763	785	819	854	888	924	935	947	947	
84	719	725	732	754	776	811	845	881	916	928	940		
82	711	717	723	745	767	802	836	873	909	921	933		
80	703	708	714	737	758	793	828	865	902	914			
78	695	700	705	728	749	784	819	857	895	907			
76	687	692	696	719	740	775	811	849	888				
74	679	683	687	710	731	767	802	841	880				
72	671	675	678	701	722	758	794	833					
70	663	666	670	692	713	749	785	825					
68	655	658	661	683	704	740	777						
66	647	650	652	674	695	731	768						
64	639	641	643	665	686	722							
62	631	633	634	656	677	714							
60	623	624	625	647	668								
58	616	616	617	638	659								
56	608	608	608	629									
Multiplier	3.95	4.20	4.45	4.48	4.50	4.39	4.27	3.94	3.60	3.55	3.50	3.42	3.33

*To interpret this index in terms of individual muscular condition divide the actual Total Strength Index x 100 by the norm for age and weight. The result is a form of the "Physical Fitness Index."

Table 149

Norms for Strength Index (With Breathing Capacity): Girls*

Weight	Age, Years												
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17
180								1529	1539	1516	1493	1482	1471
178								1519	1529	1507	1485	1474	1464
176								1509	1520	1498	1476	1466	1456
174							1488	1500	1511	1490	1468	1458	1448
172							1478	1490	1502	1481	1460	1450	1440
170							1468	1480	1493	1472	1452	1442	1433
168							1457	1470	1483	1464	1444	1434	1425
166						1418	1447	1460	1474	1455	1435	1426	1417
164						1407	1436	1451	1465	1446	1427	1418	1409
162						1396	1426	1441	1456	1437	1419	1410	1402
160						1386	1416	1431	1447	1429	1411	1402	1394
158					1345	1375	1405	1421	1437	1420	1403	1394	1386
156					1334	1364	1395	1411	1428	1411	1394	1386	1378
154					1323	1354	1384	1402	1419	1403	1386	1378	1371
152					1312	1343	1374	1392	1410	1394	1378	1370	1363
150				1252	1301	1332	1364	1382	1401	1385	1370	1362	1355
148				1241	1290	1322	1353	1372	1391	1377	1362	1355	1347
146				1230	1280	1311	1343	1362	1382	1368	1353	1347	1340
144				1220	1269	1300	1332	1353	1373	1359	1345	1339	1332
142			1161	1209	1258	1290	1322	1343	1364	1350	1337	1331	1324
140			1150	1198	1247	1279	1312	1333	1355	1342	1329	1323	1316
138			1140	1188	1236	1269	1301	1323	1345	1333	1321	1315	1309
136			1129	1177	1225	1258	1291	1313	1336	1324	1312	1307	1301
134		1094	1119	1167	1214	1247	1280	1304	1327	1316	1304	1299	1293
132		1084	1109	1156	1203	1237	1270	1294	1318	1307	1296	1291	1285
130		1075	1098	1145	1192	1226	1260	1284	1309	1298	1288	1283	1278
128		1065	1088	1135	1181	1215	1249	1274	1299	1290	1280	1275	1270
126	1034	1055	1077	1124	1171	1205	1239	1264	1290	1281	1271	1267	1262
124	1025	1046	1067	1113	1160	1194	1228	1255	1281	1272	1263	1259	1255
122	1016	1036	1057	1103	1149	1183	1218	1245	1272	1263	1255	1251	1247
120	1007	1026	1046	1092	1138	1173	1208	1235	1263	1255	1247	1243	1239
118	998	1017	1036	1081	1127	1162	1197	1225	1253	1246	1239	1235	1231
116	989	1007	1025	1071	1116	1151	1187	1215	1244	1237	1230	1227	1224
114	980	997	1015	1060	1105	1141	1176	1206	1235	1229	1222	1219	1216
112	971	988	1005	1049	1094	1130	1166	1196	1226	1220	1214	1211	1208
110	962	978	994	1039	1083	1119	1156	1186	1217	1211	1206	1203	1200

Table 149 (Continued)

Norms for Strength Index (With Breathing Capacity): Girls*

Weight	Age, Years												
	11	11½	12	12½	13	13½	14	14½	15	15½	16	16½	17
108	953	968	984	1028	1072	1109	1145	1176	1207	1203	1198	1195	1193
106	944	959	974	1018	1062	1098	1135	1166	1198	1194	1189	1187	1185
104	935	949	963	1007	1051	1087	1124	1157	1189	1185	1181	1179	1177
102	926	939	953	996	1040	1077	1114	1147	1180	1176	1173	1171	1169
100	917	930	942	986	1029	1066	1104	1137	1171	1168	1165	1163	1162
98	908	920	932	975	1018	1056	1093	1127	1161	1159	1157	1155	1154
96	899	910	922	964	1007	1045	1083	1117	1152	1150	1148	1147	1147
94	890	901	911	954	996	1034	1072	1108	1143	1142	1140	1139	1139
92	881	891	901	943	985	1024	1062	1098	1134	1133	1132	1131	1131
90	872	881	891	932	974	1013	1052	1088	1125	1124	1124	1123	1123
88	863	872	880	922	963	1002	1041	1078	1115	1116	1116	1115	
86	854	862	870	911	953	992	1031	1068	1106	1107	1107	1107	
84	845	852	859	901	942	981	1020	1059	1097	1098	1099		
82	836	843	849	890	931	970	1010	1049	1088	1089	1091		
80	827	833	838	879	920	960	1000	1039	1079	1081			
78	819	823	828	869	909	949	989	1029	1069	1072			
76	810	814	818	858	898	938	979	1019	1060				
74	801	804	807	847	887	928	968	1010	1051				
72	792	794	797	837	876	917	958	1000					
70	783	785	787	826	865	906	948	990					
68	774	775	776	815	854	896	937						
66	765	765	766	804	843	885	927						
64	756	756	755	794	832	875							
62	747	746	745	783	821	864							
60	738	736	734	772	810								
58	729	727	724	762	800								
56	720	717	714	751									
Multiplier	4.48	4.84	5.19	5.32	5.45	5.33	5.20	4.90	4.60	4.30	4.10	3.99	3.87

*This index is the same as the Total Strength Index (Tables and) but with breathing capacity of the lungs in cubic inches added as one of the test elements. The addition of breathing capacity adds little or nothing to the value of the test as a test of strength, but it is probably of some value in the prediction of general physical condition.

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